the OIL AND GAS JOURNAL

FOR ECONOMY AND LONG LIFE
YOU CAN DEPEND ON A
HUGHES Seal Grip TOOL JOINT"

HUGHES TOOL COMPANY HOUSTON, TEXAS
Standard of the Industry

PRICE 20 CENTS TABLE OF CONTENTS PAGE 33 DECEMBER 2, 1948

HALLIBURTON OIL WELL CEMENTING CO.

DUNCAN, OKLAHOMA

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1948
Vol. 47
Dec

What He Says about KINKING

One of the quickest ways to ruin a wire rope is to let it kink. That, says the Bethlehem engineer, is certain death for the rope. Even though your eye may detect no damage . . . it's been done. For kinking throws wires and strands out of harmonious balance; leads to spot wear and wire breakage long before the rope has lived its normal life.

Improper unreeling is a common cause of destructive kinking. Never lay the reel on its side without a turntable and attempt to lift off the rope. That's just asking for trouble. Instead, jack up the reel so that it revolves freely; then, while one man "brakes" the reel, another should slowly pull off the rope in a straight line.

Be careful, too, when handling a *coil* of rope—one not wound on a reel. Merely grabbing the rope and starting to pull will invariably produce damaging loops and kinks. To uncoil, place the end of the rope on the ground, then roll the coil like a hoop, in as straight a line as possible.

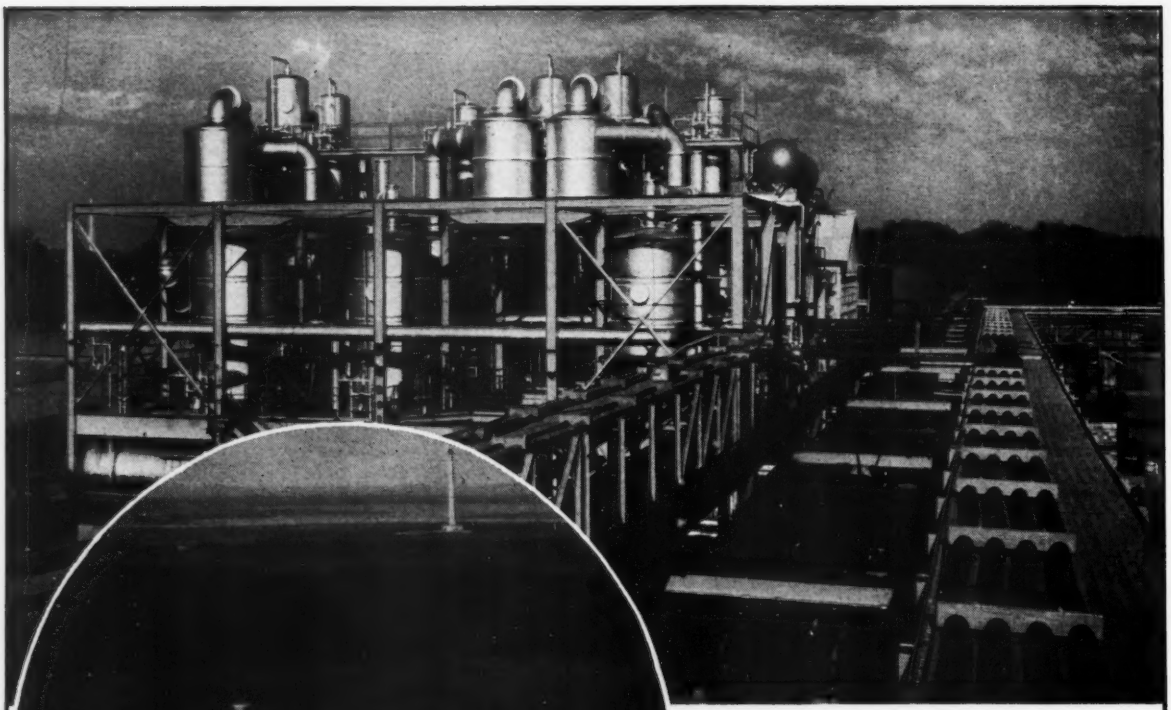
The Bethlehem field engineer will gladly give any helpful pointers on the proper way to unreel and uncoil wire rope. It's something *every* user of rope should know.

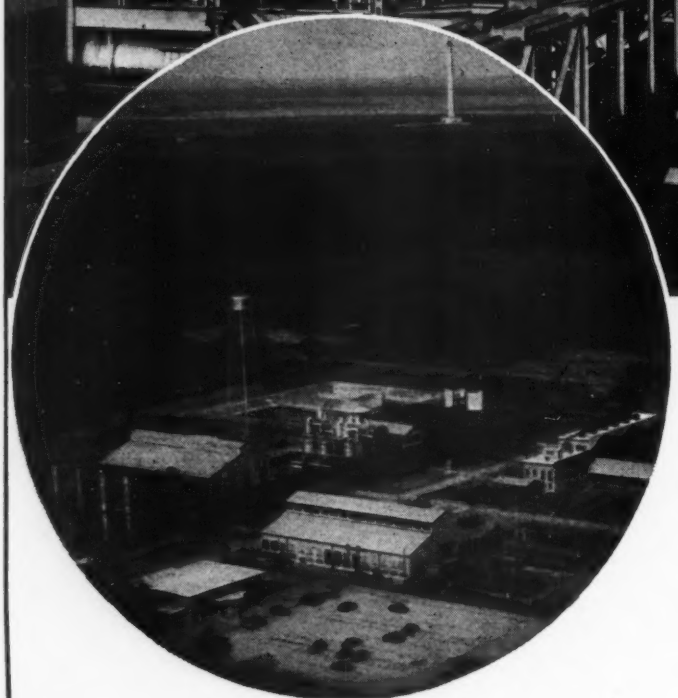
Remember, there's no charge for the services of the Bethlehem representative, no matter how much time he spends with you. It's his job to help you in selecting wire rope and getting the best service from it. Feel free to call him on any wire-rope problem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

When you think WIRE ROPE . . . think BETHLEHEM





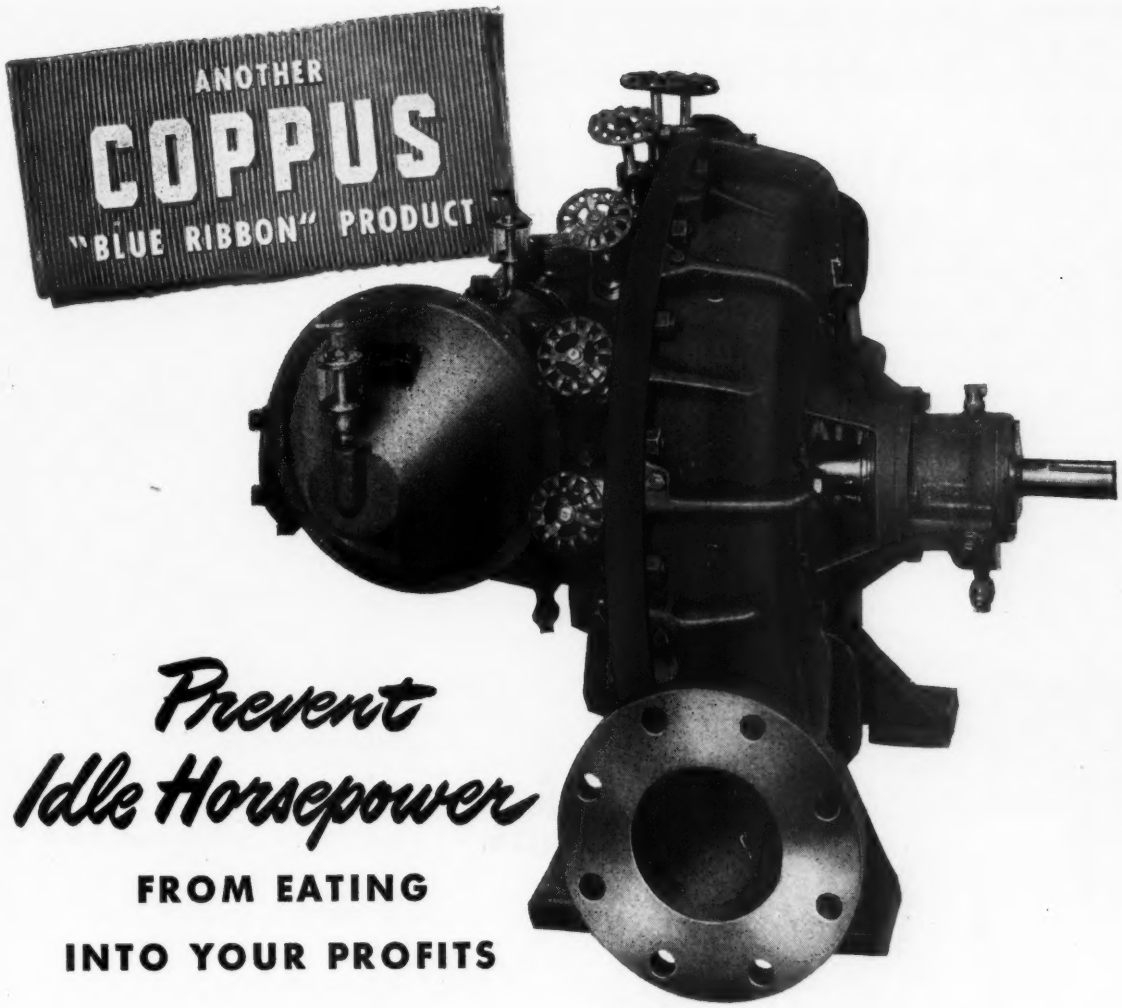
WE'RE PROUD OF DIAMOND'S NEWEST CHEMICAL WORKS

Diamond Alkali Company's newest chemical plant, the Houston Works on the Houston Ship Channel, recently went on stream, manufacturing chlorine and caustic for what it's able young president, R. F. Evans, so aptly described as "the living, growing, expanding chemical industry." Brown & Root, Inc. are proud to have been selected for engineering and construction of this great plant—proud of the part we have in the process industry in the Southwest, which is fast securing its position as a world chemical capital.

BROWN & ROOT, Inc.

P. O. Box 2634 Houston 1, Texas

The Oil and Gas Journal, published Thursdays by The Petroleum Publishing Company. Entered as second-class matter at post office at Tulsa, Okla., under act of March 3, 1879. U. S. and foreign rates to the petroleum industry, $3 yearly. Copyright 1948.



Prevent Idle Horsepower

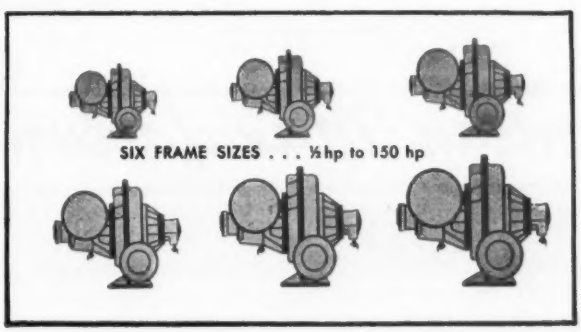
FROM EATING INTO YOUR PROFITS

Paying for a larger turbine than you need is a waste of money you can easily avoid. Coppus "Blue Ribbon" Turbines are designed to meet small-power requirements exactly. Made in six frame sizes — fractional to 150 hp, and priced accordingly — they're hard-working, smooth-running, always dependable... the logical, economical drives for your pumps, blowers, fans and similar equipment.

Coppus precision-builds these rugged performers, checks their close tolerances with Johansson blocks, gives each a thorough dynamometer test before shipment. That's why you can count on them for the cost-saving efficiency built into all Coppus "Blue Ribbon" products — blowers, ventilators, gas burners, etc.

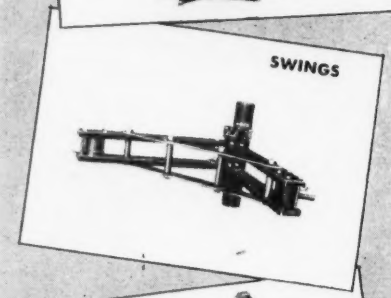
Since 1937, over 85% of all orders for Coppus Turbines have been repeat orders. Add their rapidly increasing use on top-name original equipment and you have conclusive proof of their ability to make good on the job — *your* job.

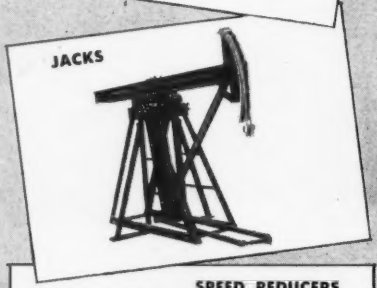
Send for Bulletin 135-10 COPPUS ENGINEERING CORPORATION, 273 Park Avenue, Worcester 2, Mass. Sales Offices in THOMAS' REGISTER. Other products in BEST'S SAFETY DIRECTORY, CHEMICAL ENGINEERING CATALOG, REFINERY CATALOG.

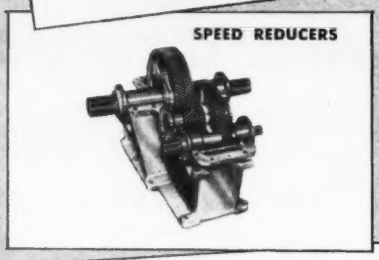


For Trouble-free pumping ... go ALL-AMERICAN

FOR 24 YEARS American equipment has been helping to lower pumping costs by giving years of trouble-free operation. Today American equipment is better than ever. The new American Pumping Units and other American items have been re-designed to A.P.I. specifications. For longer service with less servicing, specify AMERICAN for ALL your pumping equipment.



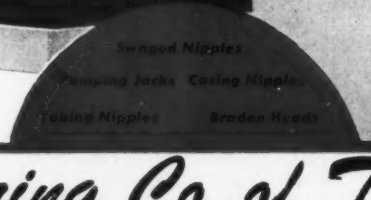




A FULL LINE OF SURFACE PUMPING EQUIPMENT

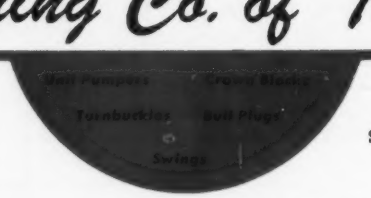
Crown Blocks ... Swaged Nipples
Bull Plugs ... Rod Line Carriers
Hook Offs and other items.

Contact your favorite supply store or the nearest American office.

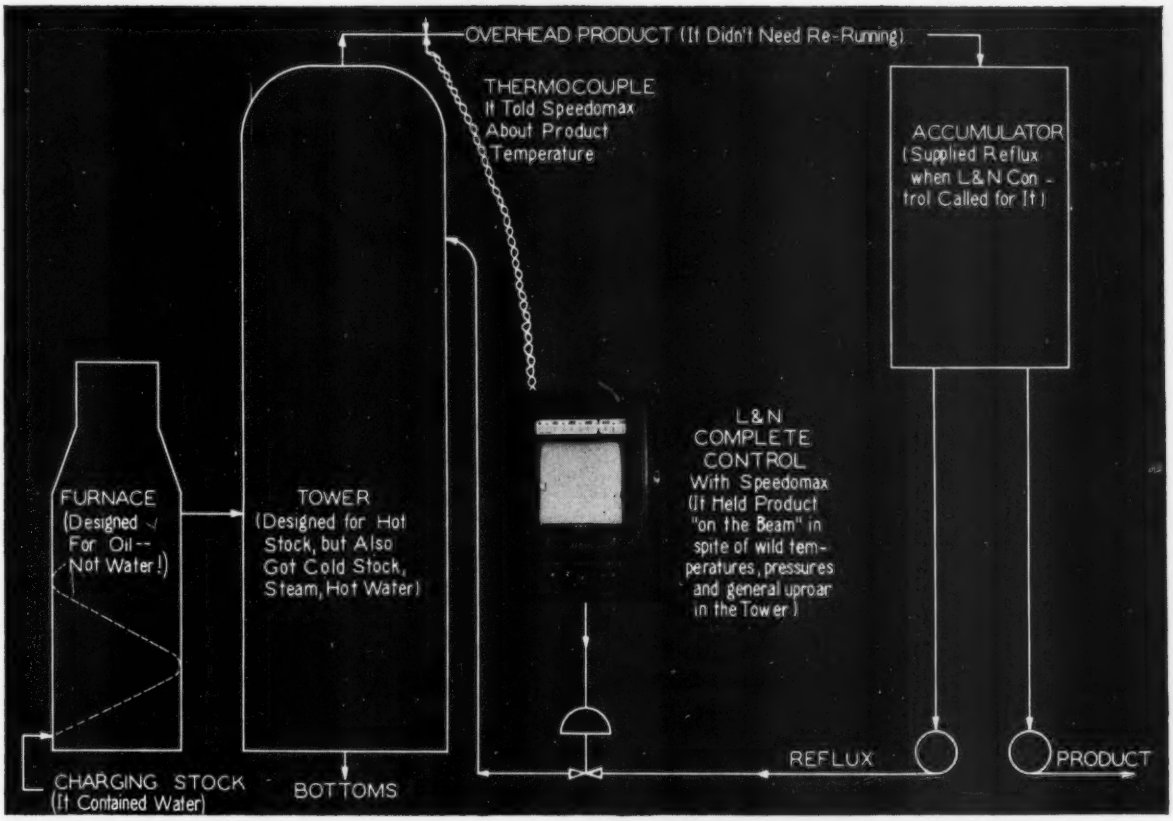


American Manufacturing Co. of Texas

FORT WORTH, TEXAS
Phone 8-2301
KILGORE, TEX., Phone 138 • ODESSA, TEX., Phone 3472
EXPORT OFFICE: Room 509, 475 Fifth Avenue, New York, New York



Since 1924



HOW TO SAVE THE DAY WHEN A UNIT GOES "CRAZY"

The single-stage fractionating unit shown above was operating normally, when, early one morning, it suddenly went crazy. The charging distillate contained water, and a good-sized slug came into the furnace tube. And—the tube temperature was about 790 F.

The water of course flashed to steam. The steam shot the charging stock ahead of it, straight out of the tube and into the tower. The charging-stock pump raced; the tube refilled. A few minutes later water again appeared, and the fresh tubefull of distillate, well below its proper temperature, shot into the tower. Again and again the same thing happened; all day long water slugs kept the whole unit and its operating personnel in an uproar.

Naturally, that unit set no production records that day. But, thanks to L&N Complete Control of tower-top temperature, such production as was achieved was all within specs—temperature never got more than 5 F off, and was held to 3 F for 90 per cent of the time. The reason for this phenomenal performance was mainly in the Complete Control's truly-stable rate action. Pressure and flow in the tower ran wild—but the Control outmaneuvered them at every turn. It snubbed temperature's leaps and plunges by varying the reflux feed widely and accurately. It saved the day.

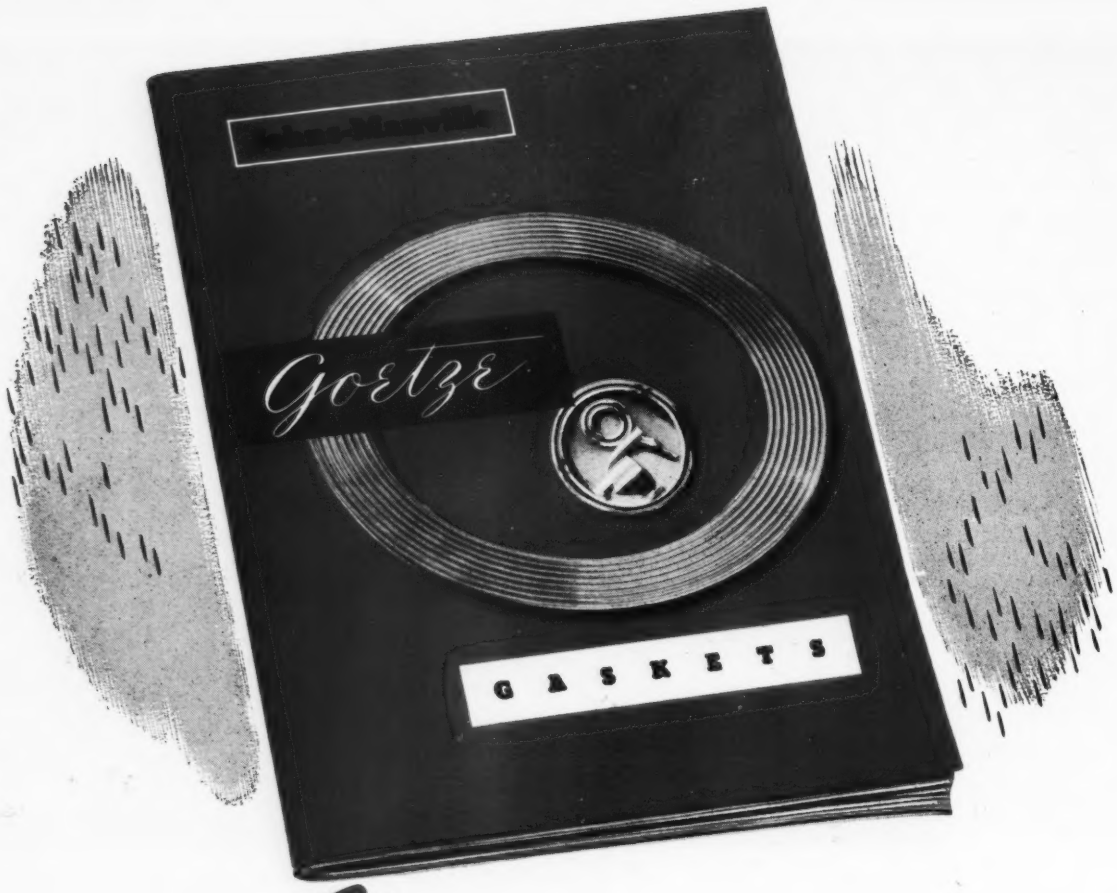
Refinery men said that, with *any* control method previously used, the day's entire run would have been "slop", requiring re-running. They estimated total savings at over $600 per hour—$4800 for the one shift! So, the Control not only saved the day, but paid for itself several times over that day.

Admittedly, such emergencies are rare. But the same features of Complete Control which met the emergency are making really large savings in many refineries in day-by-day normal service. Complete L&N Control is worth investigating! For details see new Catalog ND 4B. Write Leeds & Northrup Co., 4959 Stenton Avenue, Philadelphia 44, Pa.

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

LEEDS & NORTHRUP CO.

Jrl. Ad N-33A-702(65)



HERE'S THE *News* ABOUT METAL GASKETS

Send for this latest GOETZE GASKET CATALOG, just published by Johns-Manville

Do you want to be fully informed on the latest money-saving developments in the field of metallic gaskets?

Then send for the new 48-page Goetze Gasket catalog just off the press. Now that Goetze Gaskets are a part of the Johns-Manville line, this new catalog reflects the combined experience of two of the oldest and best-known names in gaskets—Goetze and Johns-Manville . . . brings you up to date on the strides that have been made in recent years in the design and manufacture of metallic gaskets. A handy reference chart shows at a glance the many improved Goetze types that are available now to meet your requirements.

If you buy or use metallic gaskets, you'll find the new Goetze Catalog a valuable reference guide. Write, on your company letterhead, for your free copy. Address Johns-Manville, Box 290, New York 16, N. Y.

JOHNS-MANVILLE JM PRODUCTS

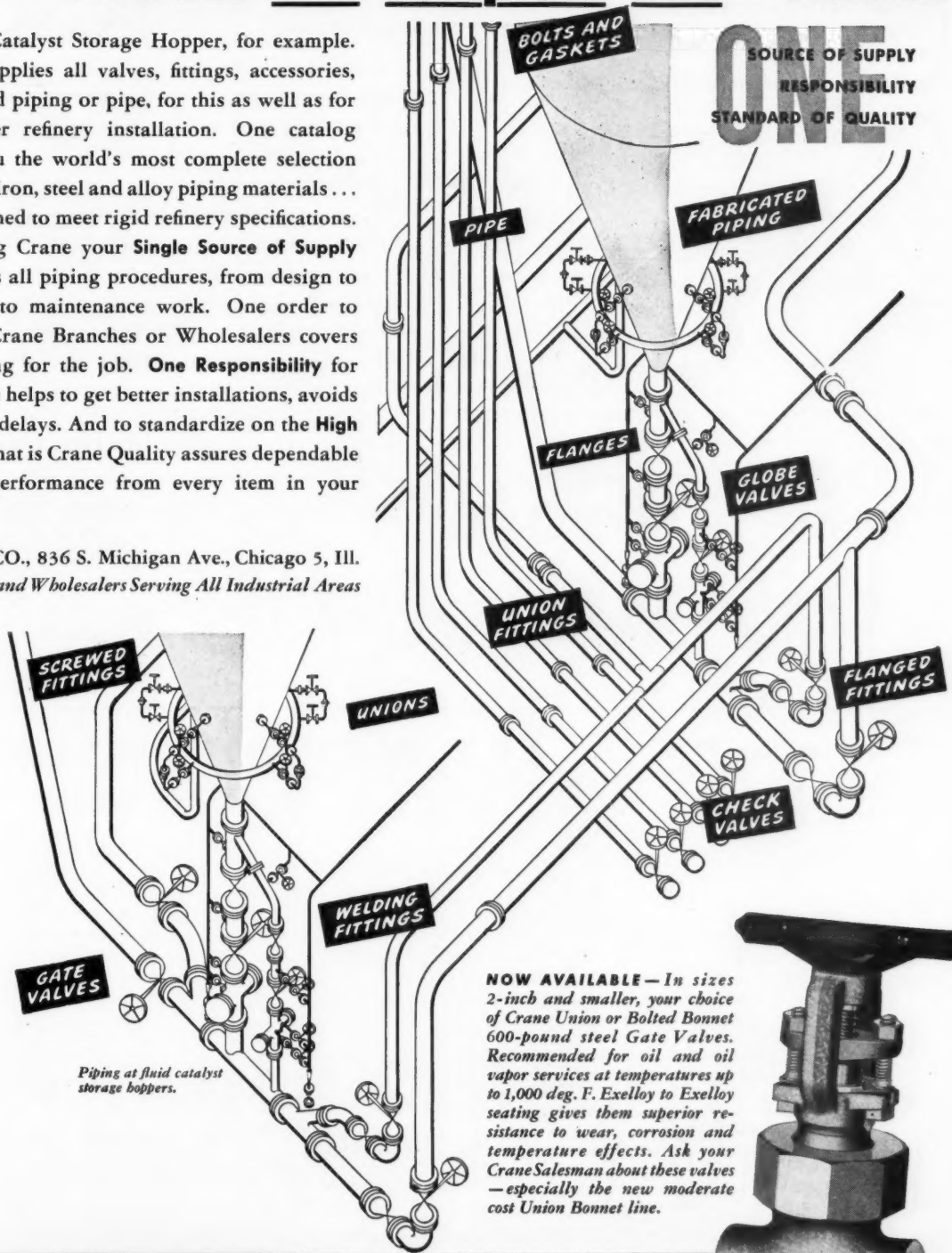
Johns-Manville Goetze Gaskets

Piping for every refinery job ...from one complete line—CRANE

Take a Catalyst Storage Hopper, for example. Crane supplies all valves, fittings, accessories, fabricated piping or pipe, for this as well as for any other refinery installation. One catalog gives you the world's most complete selection of brass, iron, steel and alloy piping materials . . . all designed to meet rigid refinery specifications.

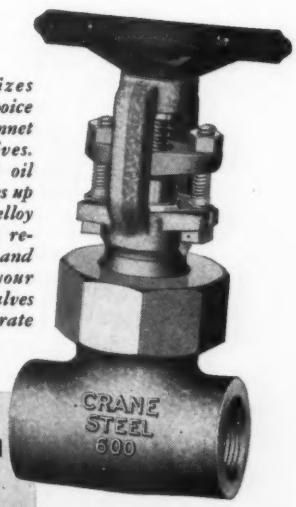
Making Crane your **Single Source of Supply** simplifies all piping procedures, from design to erection to maintenance work. One order to nearby Crane Branches or Wholesalers covers everything for the job. **One Responsibility** for materials helps to get better installations, avoids needless delays. And to standardize on the **High Quality** that is Crane Quality assures dependable piping performance from every item in your system.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



Piping at fluid catalyst storage hoppers.

NOW AVAILABLE—*In sizes 2-inch and smaller, your choice of Crane Union or Bolted Bonnet 600-pound steel Gate Valves. Recommended for oil and oil vapor services at temperatures up to 1,000 deg. F. Exelloy to Exelloy seating gives them superior resistance to wear, corrosion and temperature effects. Ask your Crane Salesman about these valves —especially the new moderate cost Union Bonnet line.*

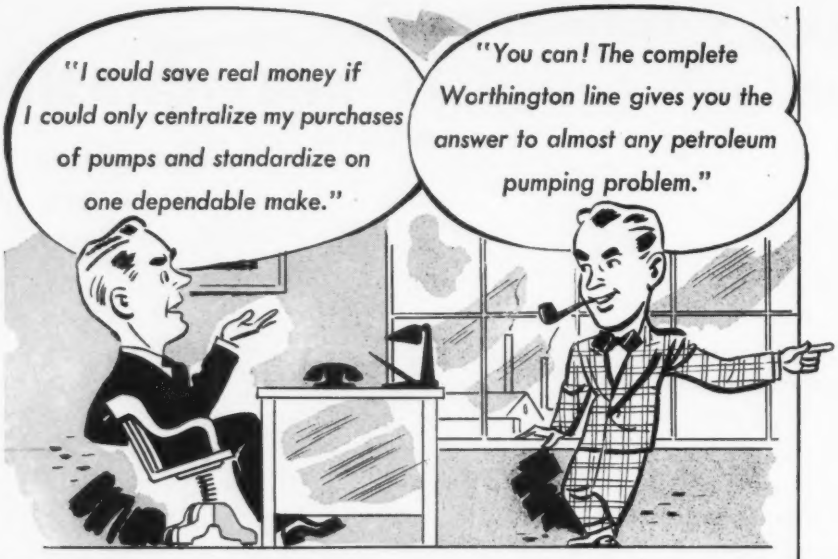


EVERYTHING FROM . . .

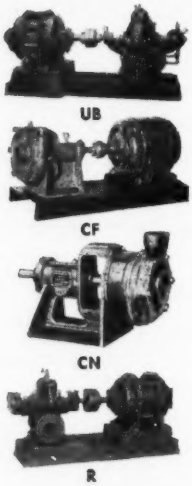
VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

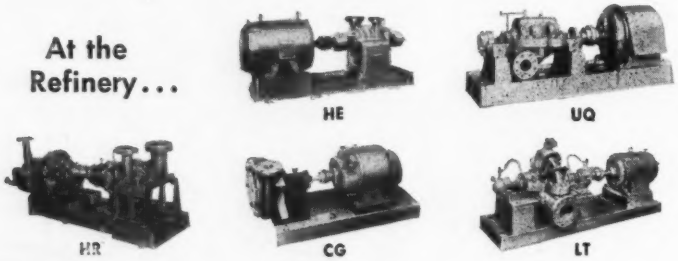
FOR EVERY PIPING SYSTEM


"I could save real money if I could only centralize my purchases of pumps and standardize on one dependable make."
"You can! The complete Worthington line gives you the answer to almost any petroleum pumping problem."

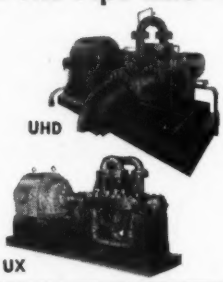
In The Field . . .



At the Refinery . . .



On The Pipe Line . . .



For Loading . . .

THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB

LET WORTHINGTON WORK WITH YOU

Yes, WORTHINGTON . . . the world's largest manufacturer of pumps . . . offers you complete service in petroleum pumps for applications in the field, in the refinery, on the pipe line and for loading operations. Why not take advantage of WORTHINGTON's long experience in petroleum pumping problems to lower your cost by standardizing on this single, dependable source?

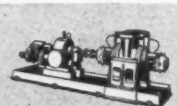
For complete information on any specific pumping application that will prove *there's more worth in Worthington,* write: *Worthington Pump and Machinery Corporation, Centrifugal Pump Div., Harrison, New Jersey.*

MEMBER

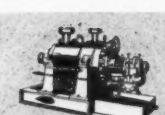
WORTHINGTON

C8.4

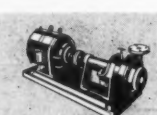
Types HR and HB. Twenty sizes. Capacities up to 1800 g.p.m. Developed heads up to 900 ft. Proper selection of material permits use for temperatures far below zero to 800°F., for pressures from high vacuum to 750 lb. per sq. in. gauge.



Type HD. Hydraulically-balanced, double-suction impeller handles boiling liquids with low submergence. Capacities range from 600 to 3200 g.p.m. at heads up to 700 ft., temperatures up to 850°F., pressures up to 550 lb.

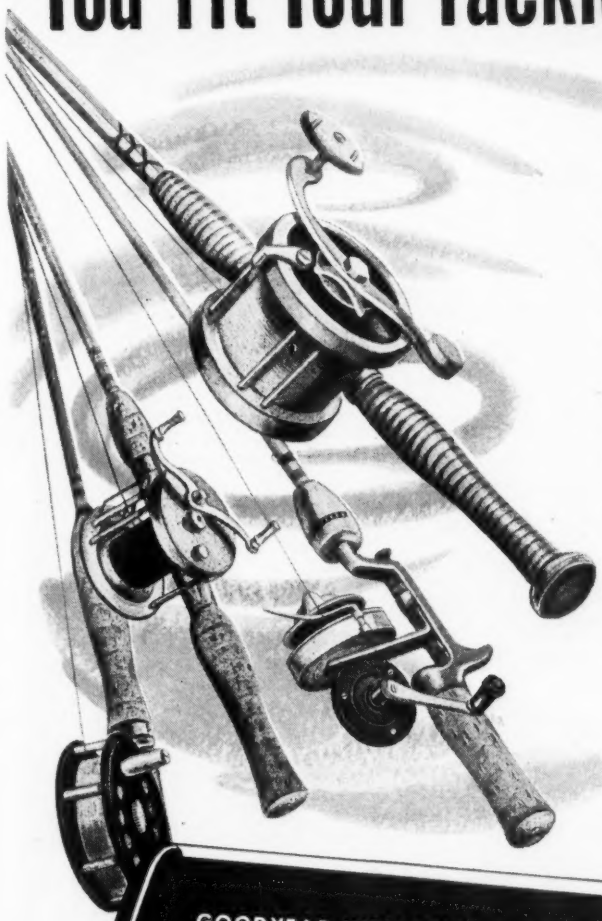


Type WH. High-pressure, high-temperature, centrifugal hot-charge pumps. Twelve distinct points of superiority, based on years of experience building pumps for high pressures and temperatures. Capacities to 2000 g.p.m., heads to 5000 ft.



Type HL. Several construction arrangements permit flexibility in application. Designed for temperatures up to 225°F., or higher with water-jacketed stuffing box. Capacities up to 1600 g.p.m., heads to 500 ft.

You Fit Your Tackle to Your Fishing



BUY V-BELTS THE SAME WAY

YOU wouldn't cast for trout with a deep-sea rig, or expect to take tuna with a fly rod. And *one* type of V-belt won't handle all the many variations of V-drive operating conditions, either.

That's why Goodyear offers the most complete line of V-belts—featuring a *special construction to meet every drive requirement.*

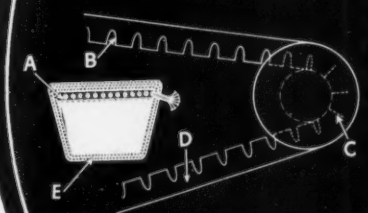
To avoid stretch problems and high-maintenance demands, there's a Goodyear exclusive—the COMPASS-V-STEEL belt sinewed with wiry steel cables. If you're having trouble with high overloads and shock stresses, turn to a Goodyear belt bodied with multiple high-tensile, resilient cords. Fast drives, with small pulleys and short centers, call for a belt with high flex-life—gained by Goodyear's single-plane endless-cord load-carrier construction. For drives where belts are hard to apply, or for quick emergency replacements, choose Goodyear's open-end belting with a special fabric body of high fastener strength.

Drive-Fitted By The G.T.M.

If you want to be sure you belt with the V-belt that's *right* for your particular needs, consult the G.T.M. —Goodyear Technical Man. He'll recommend the Goodyear V-belt to give you longest trouble-free service at the lowest cost in the long run. Write him c/o Goodyear, V-belt Sales Dept., Akron 16, Ohio.

GOODYEAR INDUSTRIAL RUBBER PRODUCTS

GTM-Specified COMPASS-V-STEEL BELT



A Load-carrying section of endless high-tensile steel cable.

B Vents open between pulleys, dissipating heat.

C Vents compress rounding pulleys, giving continuous gripping surface.

D Highest quality rubber underbody.

E Sturdy, bias-laid fabric cover resists wear.

1898 GOODYEAR 50 ANNIVERSARY 1948

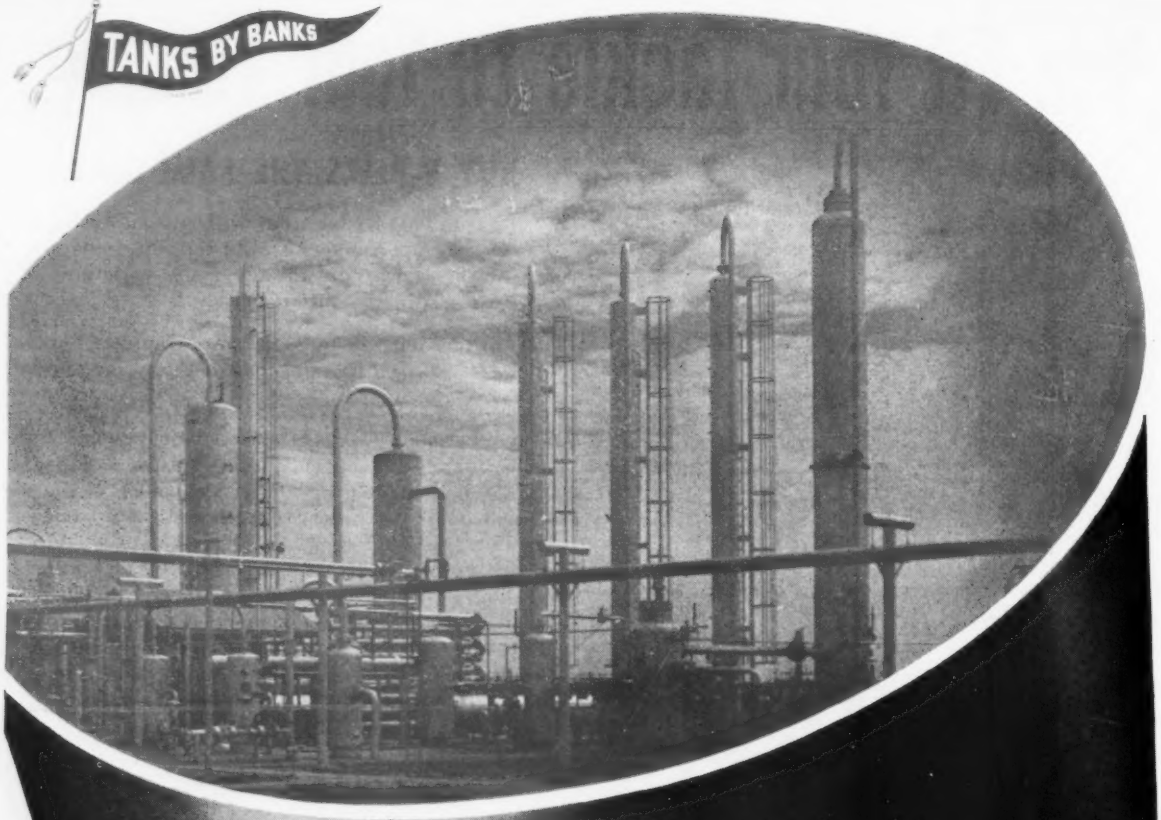
FOR BELTS, HOSE, MOLDED GOODS, PACKING, TANK LINING built to the world's highest standard of quality, phone your nearest Goodyear Industrial Rubber Products Distributor.

Compass—T.M. The Goodyear Tire & Rubber Company

GOODYEAR

V-BELTS

TANKS BY BANKS



STEEL FABRICATORS FOR THE PETROLEUM INDUSTRY

You Are Cordially Invited To Submit Your Fabrication Problems To Our Engineering Department . . .

DALLAS TANK COMPANY, INC.

201-5 W. Commerce Street • P. O. Box 5387

DALLAS, TEXAS

2½ years ago this advertisement told of 1,471 days of continuous service for a string of "K"* Monel sucker rods installed in a corrosive Texas well . . .

Never give corrosion an even break
. . . use SUCKER RODS of "K" Monel
When a sucker rod broke every 50 days . . .
. . . and the entire string had to be replaced every 5 months . . .
. . . operators of Arrington No. 2 well in the Howard Glasscock Field at Big Spring, Texas, made a wise move.

NOW...YOU CAN CHANGE THAT RECORD TO 2,397 DAYS!

Until November 1941, operators of Arrington No. 2 well in the Howard Glasscock Field at Big Spring, Texas, had sucker rod problems aplenty.

The advertisement shown above told about them. It told how a rod broke every 50 days. How the entire string had to be replaced every 5 months.

Then came "K" Monel

More important, though, was the story of how the situation changed after November 26, 1941. That was the date a string of ¾" "K" Monel sucker rods made by W. C. Norris Manufacturer, Inc., Tulsa, Okla., went into Arrington No. 2.

The "K" Monel string had been in continuous use for 1,471 days when E. G. Rodman, owner of the lease, said:

> *"The string of "K" Monel rods installed in 1941 was used every day—24 hours a day—in 2½" tubing with a 2¼" barrel until July 1944, when the 2½" tubing was replaced with 3" tubing and a 2¾" barrel (42" stroke—20 strokes per minute). Despite the considerable load increase . . . we have continued to use the same rods without a single break or shutdown due to rod failure. In addition, the rods appear to be as good as new."*

Over 15 times the life

Today — almost 7 years after installation — the original "K" Monel sucker rods are still on the job. They've seen 2,397 days of round-the-clock service — more than 15 times as much as rods used prior to November 1941!

Maybe "K" Monel holds the key to your sucker rod problem, too — or to some other equally troublesome equipment problem. For "K" Monel resists the corrosive action of sour crudes. It withstands stress, vibration and flow-cutting. It serves dependably even in high-velocity wells that produce sand. Heat-treated to develop its tensile strength to 145,000-170,000 psi, and its hardness to 25-35 Rockwell "C", "K" Monel brings long and improved performance to many types of oil field equipment.

There's help for you here

The full story of how you can put "K" Monel and other INCO Nickel Alloys (like Monel* and Inconel*) to work for you, is told in our new, illustrated booklet, ***Controlling Corrosion in Petroleum Production Equipment.*** Send for your copy, and get typical performance and service stories of Nickel Alloys in a variety of corrosive uses. Read a discussion of the important factors in reducing maintenance and replacement costs.

In addition to sections dealing with exploration and drilling, pumping and gas control, the booklet tells how you can get free technical advice on the selection of materials for severe service, and contains a listing of valuable Technical Bulletins that are available. Write us for your copy — now.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

*Reg. U.S. Pat. Off.

EMBLEM OF SERVICE

MAIL THIS COUPON TO INCO TRADE MARK

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Without obligation, please send me a copy of your new, illustrated booklet, ***Controlling Corrosion in Petroleum Production Equipment.***

Name.....Title.....

Company.....

Street.....

City.....Zone.....State.....

O. & G. J.—10-48

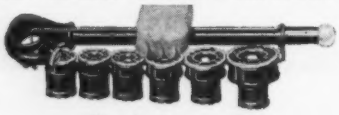
"K"* MONEL

YOUR PARTNER IN PROGRESS

Thread Small Pipe

RIDGID Ratchet Threaders Nos. 00R, 111R and 12R make short work of threading 1/8" to 2" pipe

● No fuss or bother getting ready—just snap in size die head you need and these smart little RIDGIDs are ready to go to work. You don't need special dies for close-to-wall threads. Heat-treated tool-steel dies give you fast clean accurate threads. These efficient durable RIDGID threaders are favorites with pipe tool users everywhere. Buy them at your Supply House.



. . . Handy free carrier for any group of sizes.

Clean Accurate Pipe Cuts at Top Speed

RIDGID efficiency-balanced cutter saves your muscle . . . gives you more pipe cuts for your money . . .

● The efficiency-balanced RIDGID Cutter is a natural for extra fast clean pipe cutting. Thin blade tool-steel cutter wheel always tracks perfectly—leaves practically no burr. Every cutter factory-tested to make sure of it. Your choice of 5 sizes to 6" pipe; 4-wheel cutters to 4," designed for easier work in tight places. Save your time and muscle—buy RIDGID Cutters at your Supply House.

RIDGID
WORK-SAVER PIPE TOOLS
THE RIDGE TOOL COMPANY • ELYRIA, OHIO

RIDGID
WORK-SAVER PIPE TOOLS
THE RIDGE TOOL COMPANY • ELYRIA, OHIO

For BETTER TEMPERATURE CONTROL

GET A COPY OF NEW BULLETIN 329

It will help make it easy for you to select the simplest, most dependable type of control made for many of the following applications:

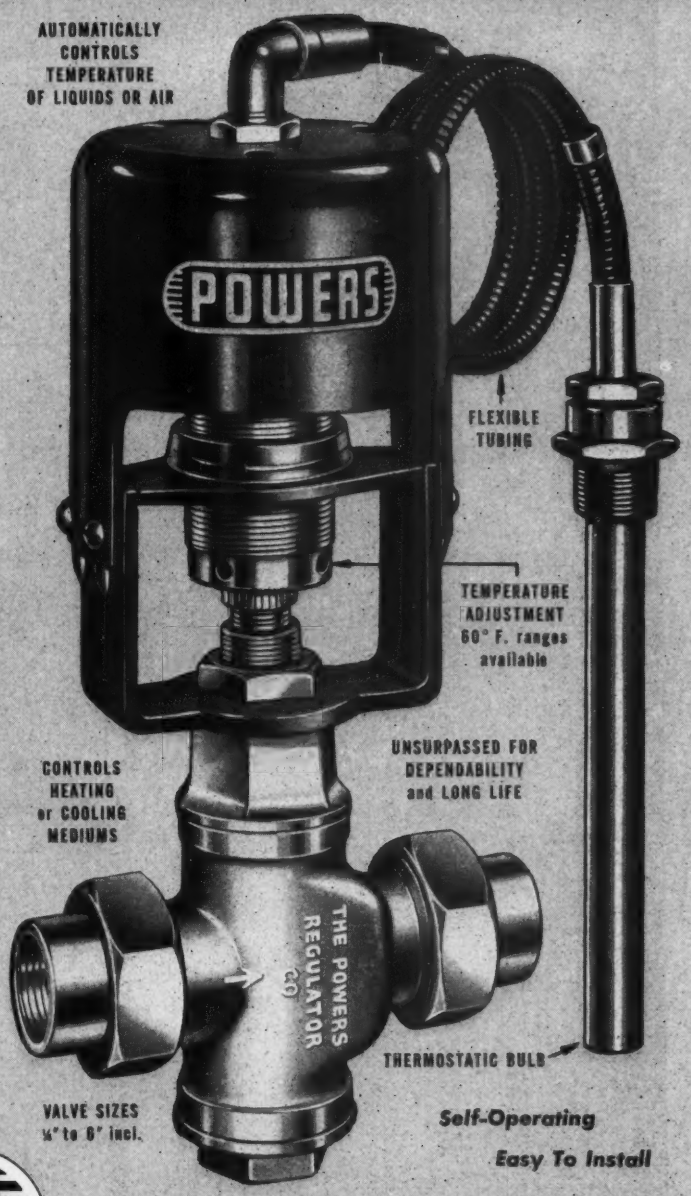
Crude Oil SEPARATORS, TREATERS, and HEATERS • Cooling Water for DIESEL, GAS ENGINES AND COMPRESSORS Also WATER HEATERS, FUEL OIL HEATERS • CONDENSERS HEAT EXCHANGERS—*and many other uses*

Quickly Pay Back Their Cost

Controlling heating operations they prevent OVER heating—save fuel and labor—improve production

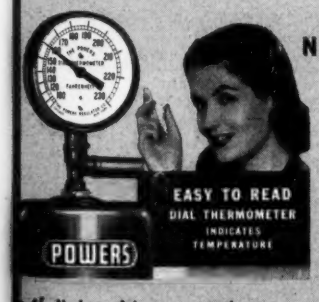
Controlling cooling water for diesel, gas engines and compressors they help prevent OVER and UNDER cooling—increase operating efficiency and reduce consumption of cooling water

TYPES AVAILABLE: Direct and reverse acting regulators—**Double Seat balanced valve, double unions ½" to 2" incl., flanged 2½" to 6" incl.—Single Seat valve double unions ¼" to 1½" incl.—3-Way valve ½" to 4" incl.—Temperature Indicating regulator—all are shown in new Bulletin 329. Get a copy and prices from our nearest office.**



Use

POWERS



No. 11 INDICATING REGULATOR

Combining an easy to read dial thermometer with a self operating regulator was pioneered by POWERS in 1930. Thermometer has 4" dial and is mounted on top of the regulator. Both thermometer and regulator operate from same thermal system. Only one tapped opening required. A visual check on performance of the regulator is provided and it is easy to adjust for different temperatures.

No. 11 REGULATORS

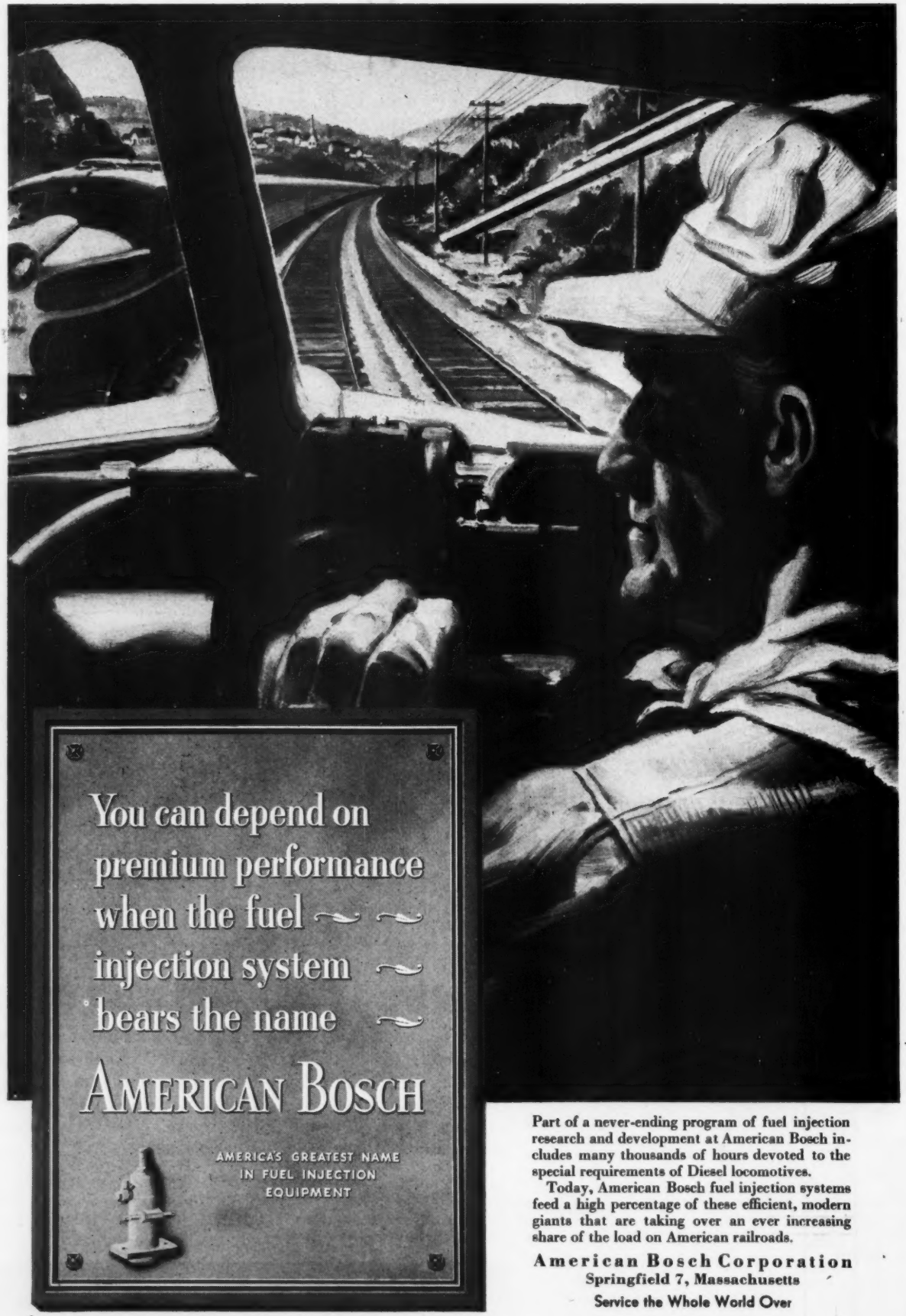
When you want a simple, rugged control to maintain a constant temperature with unfailing dependability . . . install a POWERS regulator. They often give 10 to 25 years of service and pay back their cost several times a year. No compressed air or electricity required. May be just the regulator to solve some of your temperature control problems. ***Write for Bulletin 329.***

CHICAGO 14, ILL., 2720 Greenview Ave., NEW YORK 17, N. Y., 231 E. 46th St., LOS ANGELES 5, CAL., 1808 W. 8th Street, TORONTO, ONT., 195 Spadina Ave., Offices in leading oil centers: HOUSTON, DALLAS, OKLAHOMA CITY, TULSA, PITTSBURG, KANSAS CITY, DENVER, NEW ORLEANS and many foreign countries. (11D)

THE POWERS REGULATOR CO.

OFFICES IN 50 CITIES • SEE YOUR PHONE BOOK

Over 55 Years of Temperature and Humidity Control



Part of a never-ending program of fuel injection research and development at American Bosch includes many thousands of hours devoted to the special requirements of Diesel locomotives.

Today, American Bosch fuel injection systems feed a high percentage of these efficient, modern giants that are taking over an ever increasing share of the load on American railroads.

American Bosch Corporation
Springfield 7, Massachusetts
Service the Whole World Over

Not Just Luck...

Built Better to Last Longer

"PERFECTLY ENGINEERED PACKINGS"

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Asbestos Braided Valve Stem Packing
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Install Linear Packings and keep cost records. You'll be surprised at the maintenance money you will save. Stocked by all Jones & Laughlin Supply stores.

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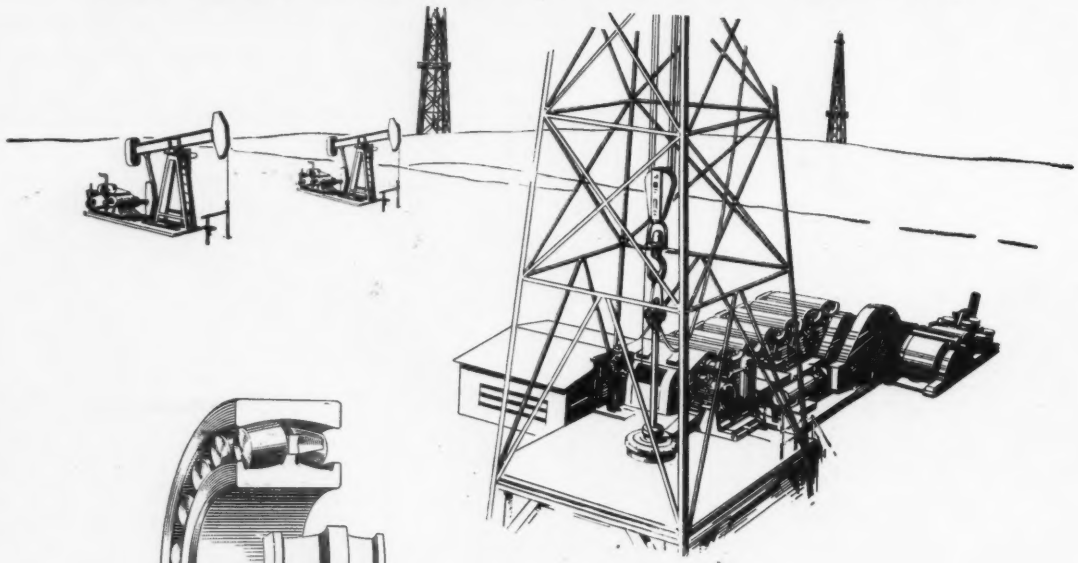
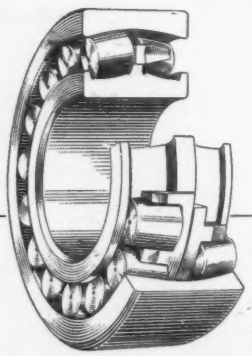
J&L STEEL

For Rugged day-in, day-out Performance of Oil Field Equipment Count On Torrington Spherical Roller Bearings





. . . high radial capacity of these self-aligning roller bearings is an important advantage in oil field equipment.

All around the oil field—in drilling rigs, slush pumps, unit pumpers, draw works, transmissions, rotary table drives and other equipment—Torrington Spherical Roller Bearings contribute to improved performance and longer service life under the most rugged conditions.

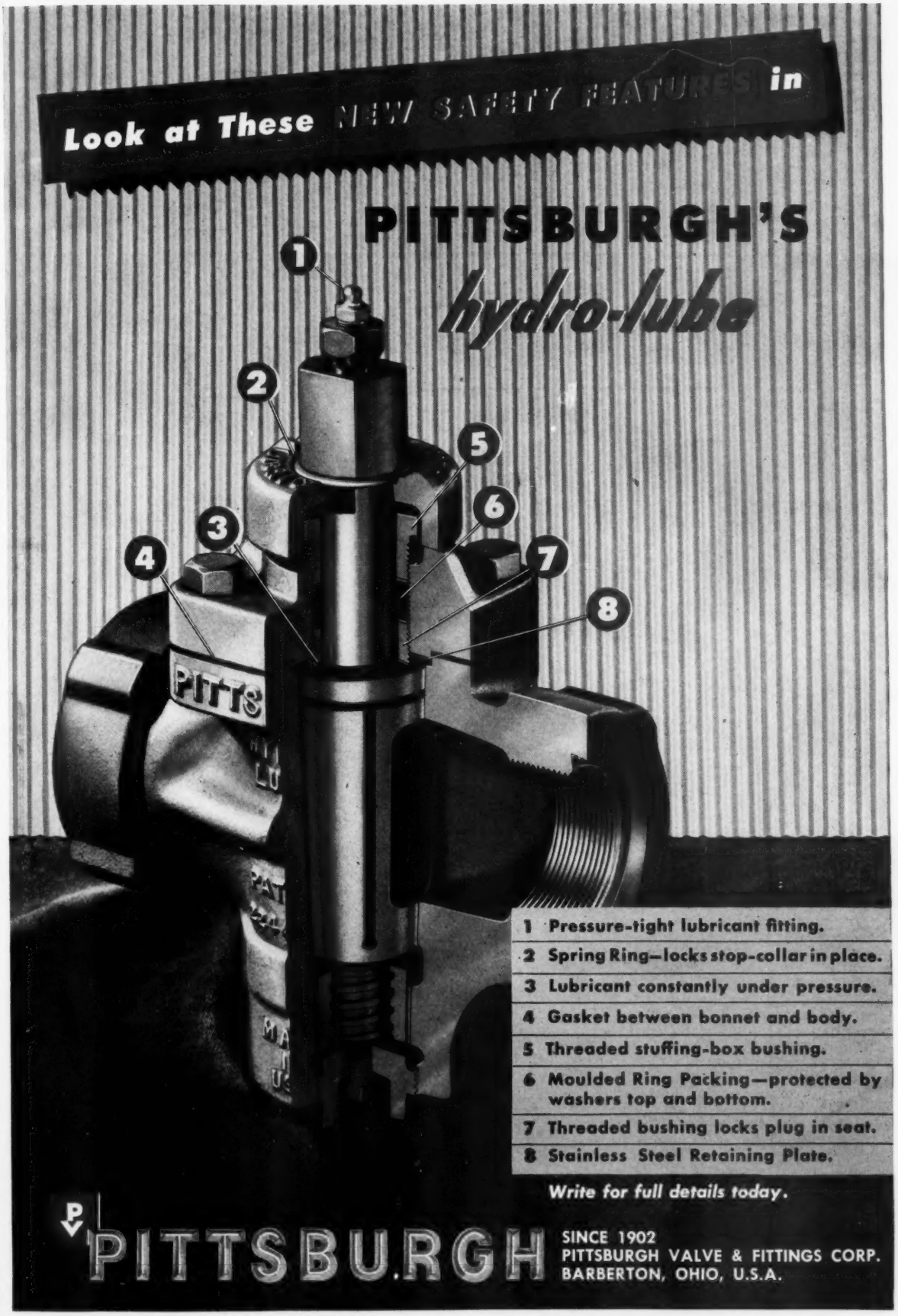
Here are some of the specific benefits you receive from the use of these heavy-duty anti-friction bearings. High radial capacity. Reduced power consumption and higher speeds. Self-alignment. Axial stability of shafts for proper meshing of gears. Close tolerances that protect oil seals and assure efficient lubrication.

Whether you are building new equipment or making replacements, you can always count on Torrington Spherical Roller Bearings. You can count, also, on our impartial advice in helping you select *exactly* the right bearing for your needs—based on Torrington's years of experience in designing and building *all major types* of anti-friction bearings. Call or write the nearest Torrington office.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District Offices and Distributors in Principal Cities

TORRINGTON SPHERICAL ROLLER **BEARINGS**

SPHERICAL ROLLER · TAPERED ROLLER · STRAIGHT ROLLER · NEEDLE · BALL · NEEDLE ROLLERS


Look at These NEW SAFETY FEATURES in
PITTSBURGH'S
hydro-lube
1
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PITTS
1 Pressure-tight lubricant fitting.
2 Spring Ring—locks stop-collar in place.
3 Lubricant constantly under pressure.
4 Gasket between bonnet and body.
5 Threaded stuffing-box bushing.
6 Moulded Ring Packing—protected by washers top and bottom.
7 Threaded bushing locks plug in seat.
8 Stainless Steel Retaining Plate.
Write for full details today.
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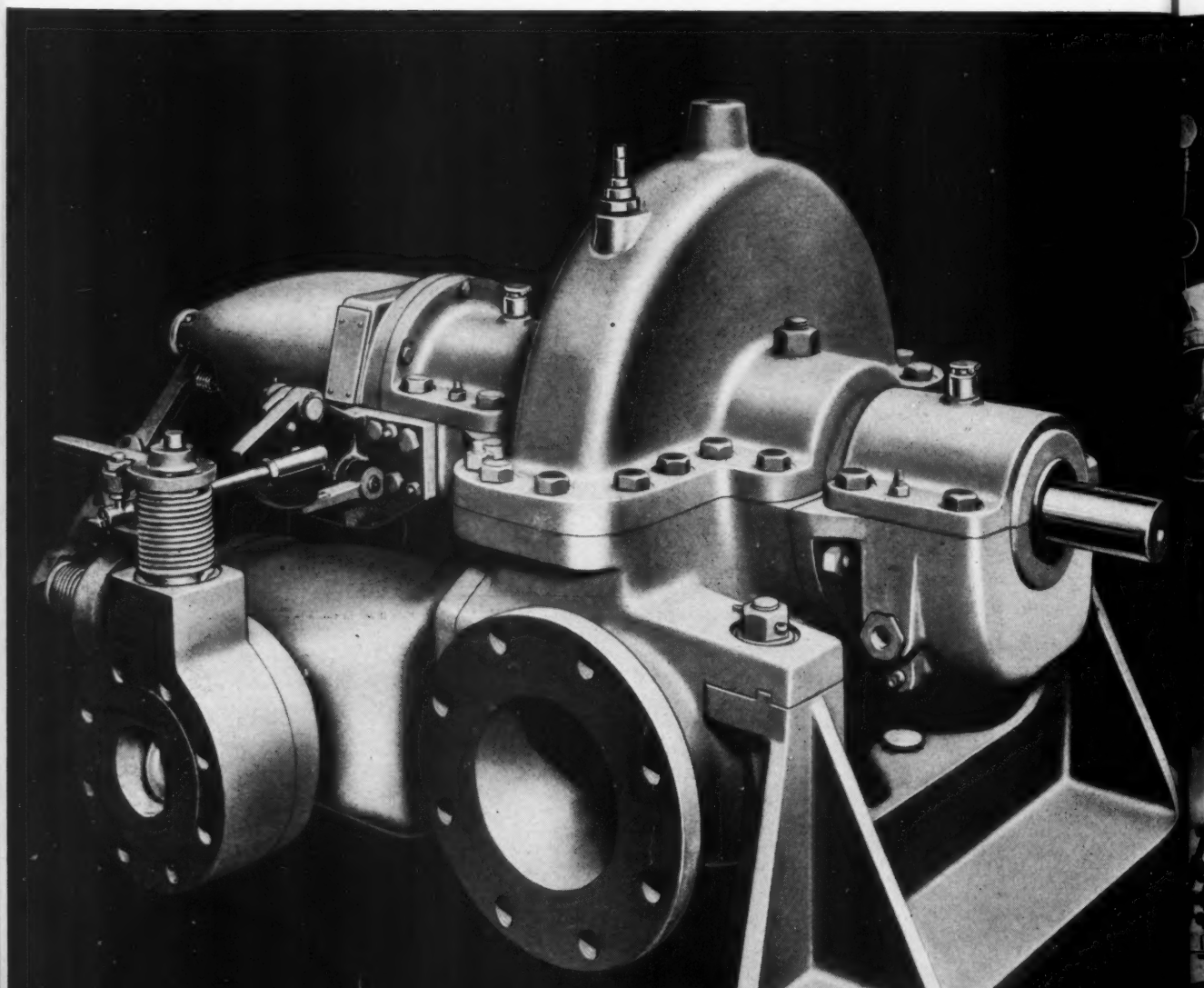
PITTSBURGH
SINCE 1902
PITTSBURGH VALVE & FITTINGS CORP.
BARBERTON, OHIO, U.S.A.

For RUGGEDNESS, RELIABILITY



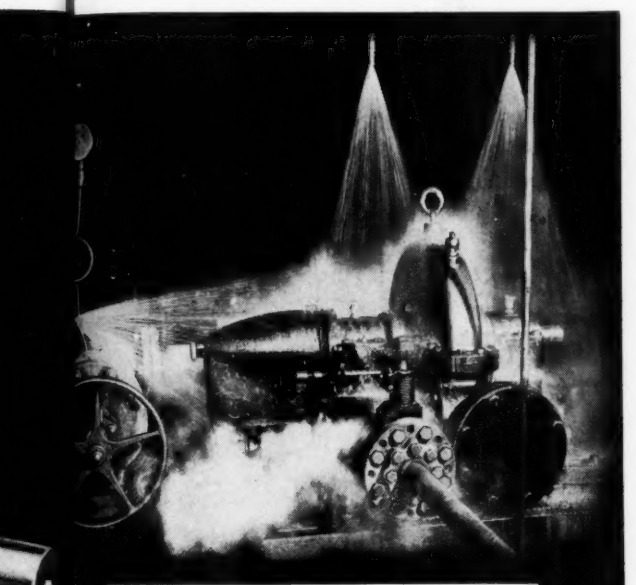
TYPE E TURBINES DO THESE JOBS WELL! . . .

PUMP DRIVES • FAN DRIVES • COMPRESSOR DRIVES
A-C AND D-C GENERATOR DRIVES • DRIVES FOR . . .
Paper Machines, Jordans, Beaters, Coal Pulverizers and Line Shafts

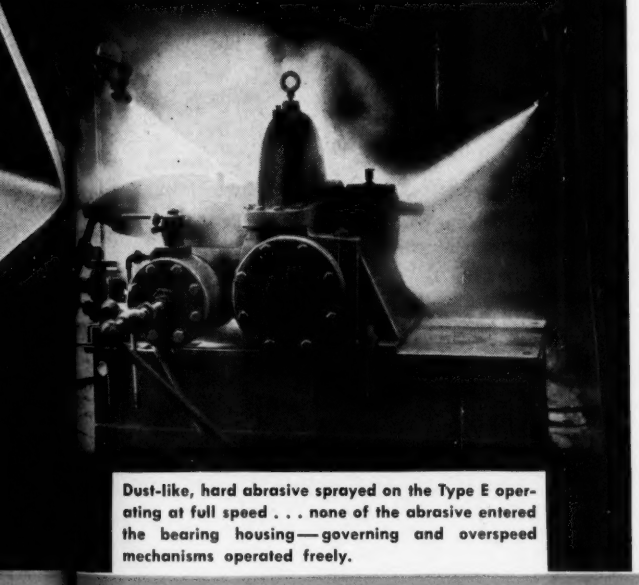
WESTINGHOUSE

and ECONOMY

Count on TYPE E General Purpose Turbines



Water-test periods running for hours and hours—with turbine *operating* and *standing still*—prove the effectiveness of Type E bearing seals against water contamination of lubricating oil.



Dust-like, hard abrasive sprayed on the Type E operating at full speed . . . none of the abrasive entered the bearing housing—governing and overspeed mechanisms operated freely.

Type E turbines can "take it" under the most adverse conditions . . . in wet or dry locations, outdoors in any kind of weather, in subbasements . . . or anywhere that "the going is tough!"

Superior features which make the Type E *outstanding* are weatherproof bearing seals, corrosion-resisting gland zones, centerline support, dual-protection against overspeed, floating movement of governing and trip linkages, and parts interchangeability. These features minimize maintenance time and cost where Type E turbines are applied. Such features also assure dependable performance in continuous or "stand-by" operation.

Here's how ruggedness, reliability and economy are represented in Type E *turbines!*

RUGGEDNESS . . . The strong and sturdy appearance of the Type E exterior is characteristic of *all* parts that must withstand severe service for years.

RELIABILITY . . . Very special care, skill and experience are employed in the design and construction of Type E turbines to assure outstanding performance for long periods of continuous operation . . . or *instant* service when required as a "stand-by" unit.

ECONOMY . . . The Type E is carefully designed to provide for *maximum conversion* of heat energy into horsepower. For most economical selection, a variety of wheel sizes is available. This is particularly advantageous in plants where a number of turbines are required for different locations, and it is desirable to standardize on a single make. Interchangeability of parts between wheel sizes furthers this advantage.

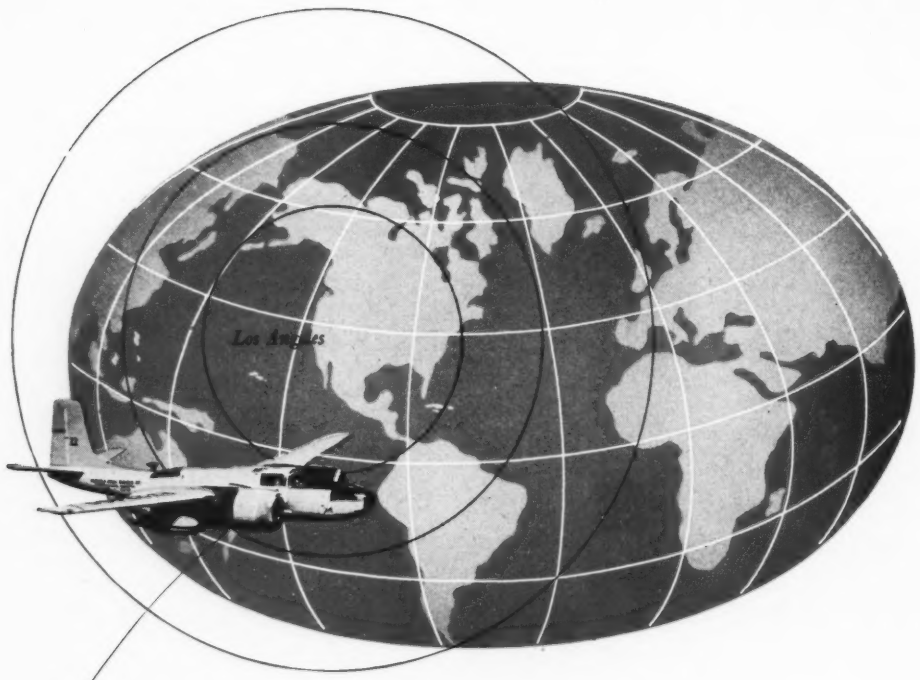
Get all the facts. Call your Westinghouse representative . . . or write for Booklet B-3896 . . . Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Penna.

J-50489-A

YOU CAN BE SURE . . . IF IT'S Westinghouse

Westinghouse Steam Headquarters

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE



AIRBORNE MAGNETOMETER COVERS ALL AREAS—LAND OR WATER

Fairchild provides a new horizon in magnetic mapping

IN FLIGHT, over land, water . . . any type of terrain, Fairchild provides a vastly enhanced magnetic mapping service with the airborne magnetometer. Speed, accuracy, and low cost are featured by Fairchild methods of magnetic mapping. The limitations inherent to ground methods are largely eliminated. For the first time, magnetic mapping procedures are *practicable over water.* Skillfully executed by Fairchild engineers, surveys conducted with the airborne magnetometer can benefit your petroleum explorations. **BASE-FORMATION PROFILES,** as flown by Fairchild with the Gulf Research & Development Company magnetometer, differ from ground survey methods in at least three important aspects:

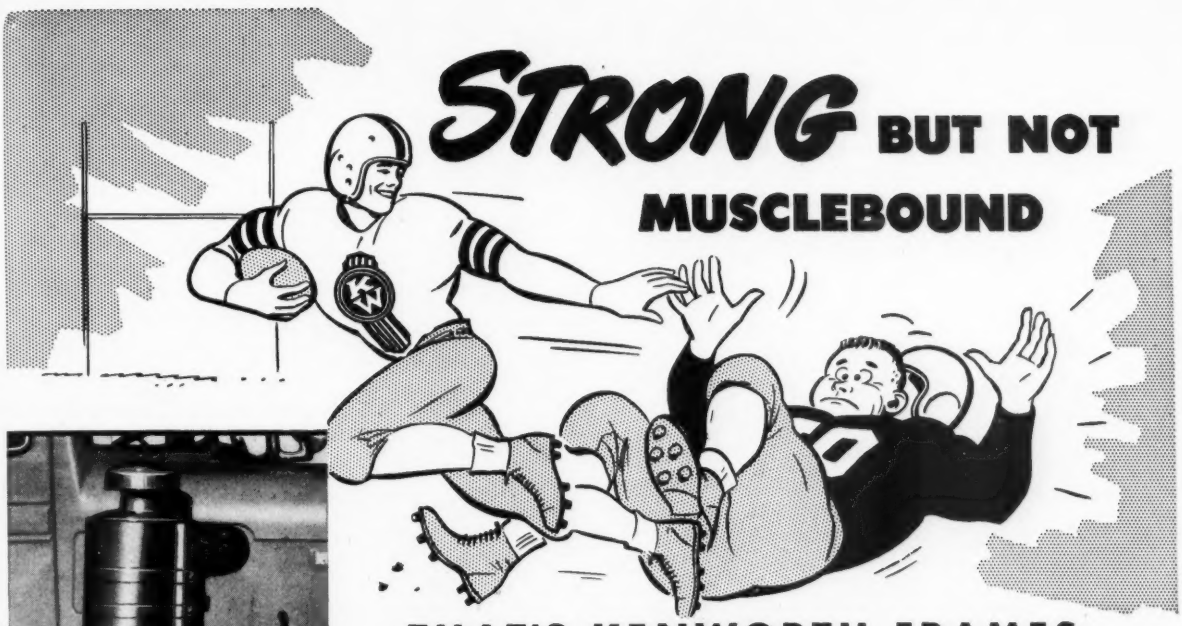
1. Speed
2. Freedom from misleading surface effects
3. Effective everywhere

FOR COMPLETE INFORMATION on the value of Fairchild methods to you, make your survey plans in consultation with Fairchild engineers. No obligation, of course, for preliminary planning.

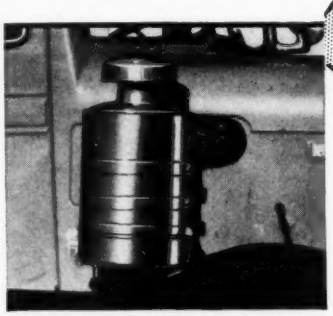
Fairchild AERIAL SURVEYS, INC.

PHOTOGRAMMETRIC ENGINEERS • 224 EAST ELEVENTH STREET, LOS ANGELES 15, CALIFORNIA

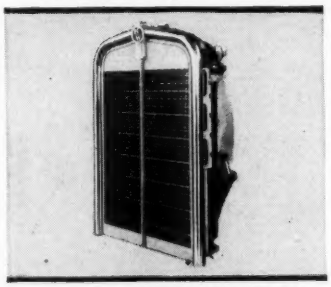
STRONG BUT NOT MUSCLEBOUND



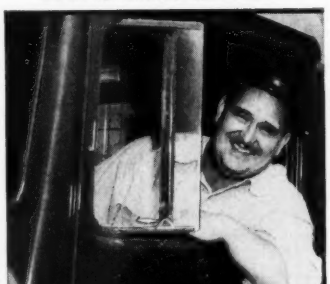
THAT'S KENWORTH FRAMES



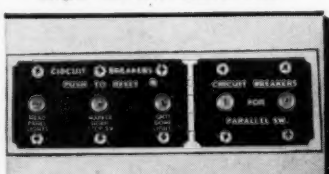
Air cleaners on Kenworth trucks are outside mounted for greater efficiency.



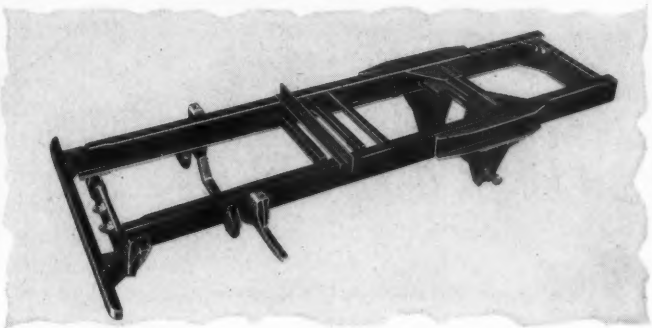
Better cooling is assured by Kenworth's tube and fin high-efficiency type radiators.



Greater comfort for the driver has been designed into each Kenworth truck.



Kenworth trucks need no fuse replacements because of manually reset circuit breakers.



A truck's frame is its backbone, and a good backbone—whether it's at work on the gridiron or the highway — requires strength, and yet must be flexible, if it is to do the job well. Kenworth truck frames give you just that—ruggedness and strength without rigidity. Kenworth frames are constructed of the best chrome manganese heat-treated alloy steel. Large section rails, deep and numerous cross-members and large gussets are riveted with ample size and number of rivets. Aluminum frame rails and castings are also available. Kenworth's leadership in frame design and construction is another reason why *there's more* **WORTH** *in* **KENWORTH.**

KENWORTH

TRUCKS BUSES

FACTORY AND HOME OFFICE SEATTLE, U.S.A.

DISTRIBUTORS IN THE UNITED STATES AND MOST FOREIGN COUNTRIES

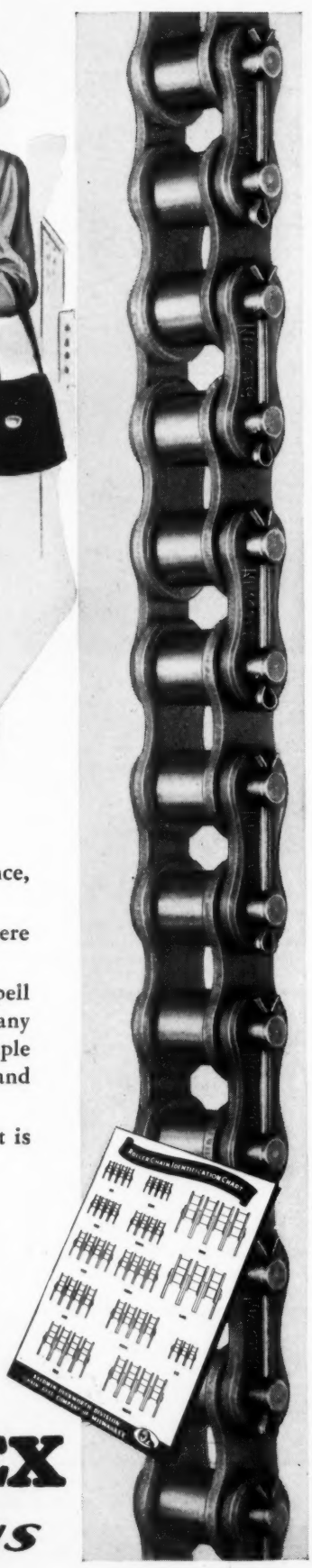
Sure, they look alike ...but

... even identical twins are different! Personality, intelligence, ability can vary considerably.

Similarly with roller chains, even though they may look alike, there are designed-in differences that drastically affect performance.

Baldwin-Rex Roller Chains have important advantages that spell longer life . . . more economical service for your rigs. One of the many features is the press fit of the inner side plates on the pins of multiple width chains . . . a feature that eliminates the motion between pin and side plates and prevents early pin failure.

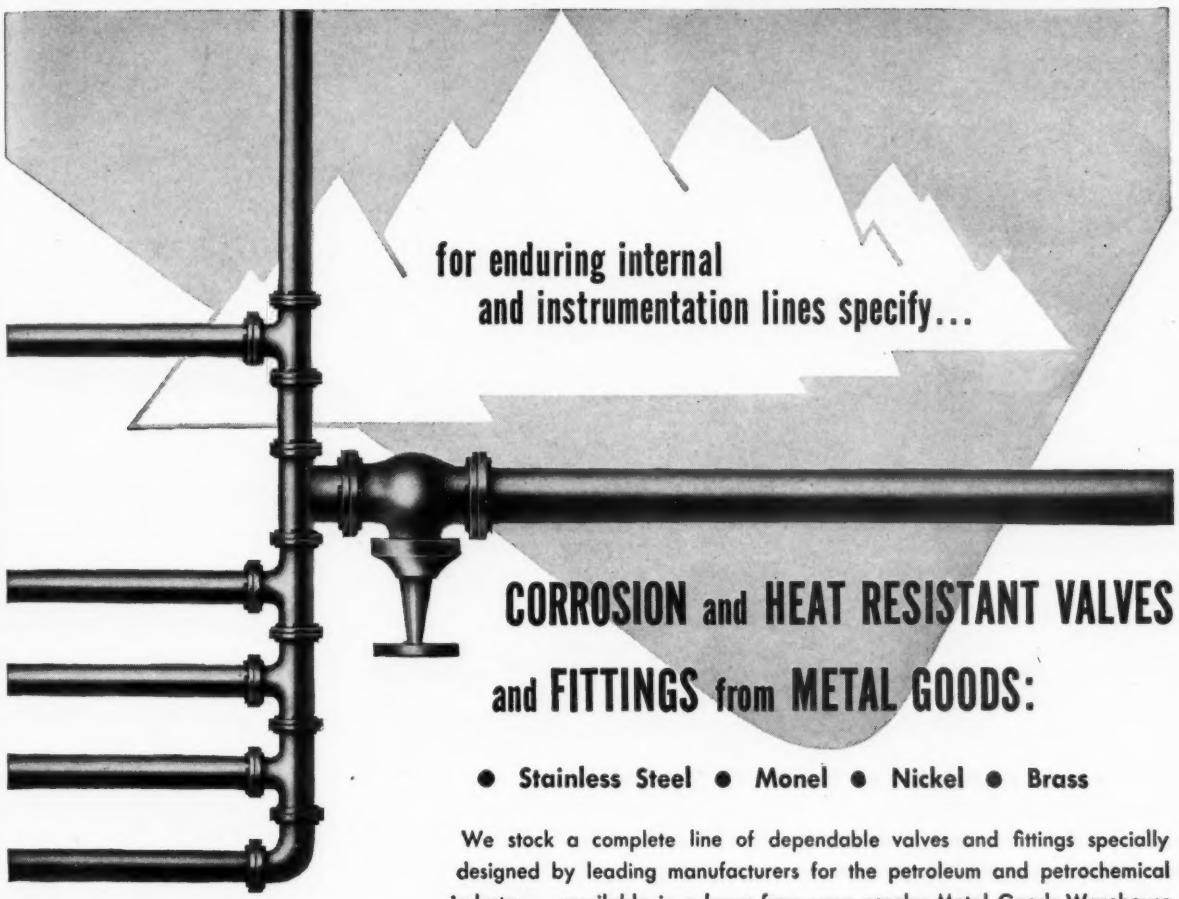
Next time, don't ask for roller chain . . . *ask for Baldwin-Rex.* It is interchangeable with any corresponding size roller chain.



Send for your free copy of this time-saving wall chart of Oil Field Roller Chains. Just compare the worn chain with the drawings on the chart and order the new Baldwin-Rex Chain by number from your local supply store. That's all there is to it. BALDWIN-DUCKWORTH DIVISION OF CHAIN BELT COMPANY, 357 PLAINFIELD STREET, SPRINGFIELD 2, MASSACHUSETTS

BALDWIN·REX

ROLLER CHAINS



for enduring internal
and instrumentation lines specify...

CORROSION and HEAT RESISTANT VALVES and FITTINGS from METAL GOODS:

● Stainless Steel ● Monel ● Nickel ● Brass

We stock a complete line of dependable valves and fittings specially designed by leading manufacturers for the petroleum and petrochemical industry . . . available *in a hurry* from your nearby Metal Goods Warehouse whenever you need them!

▶ **FOR INTERNAL LINES IN CRACKING PLANTS:** All types of heat-and-corrosion resistant valves and fittings, including carbon or stainless steel needle valves built to withstand high pressures and to A. P. I. specifications.

▶ **FOR INSTRUMENTATION:** A wide variety of tube fittings and valves, as well as all sizes of stainless steel, copper and monel tubing.

WE ALSO STOCK CORROSION-RESISTANT FASTENINGS. A complete selection of long-lived Stainless and Monel fastenings is available in stock from all our warehouses.

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Dallas, 6211 Cedar Spring Rd., Dixon 4-3925, **New Orleans,** 432 Julia, Canal 7373, **Denver** 817 17th St., Main 9030

HERE'S WHAT THEY SAY ABOUT BUCYRUS-ERIE SPUDDERS . . .

'Handles everything easier'

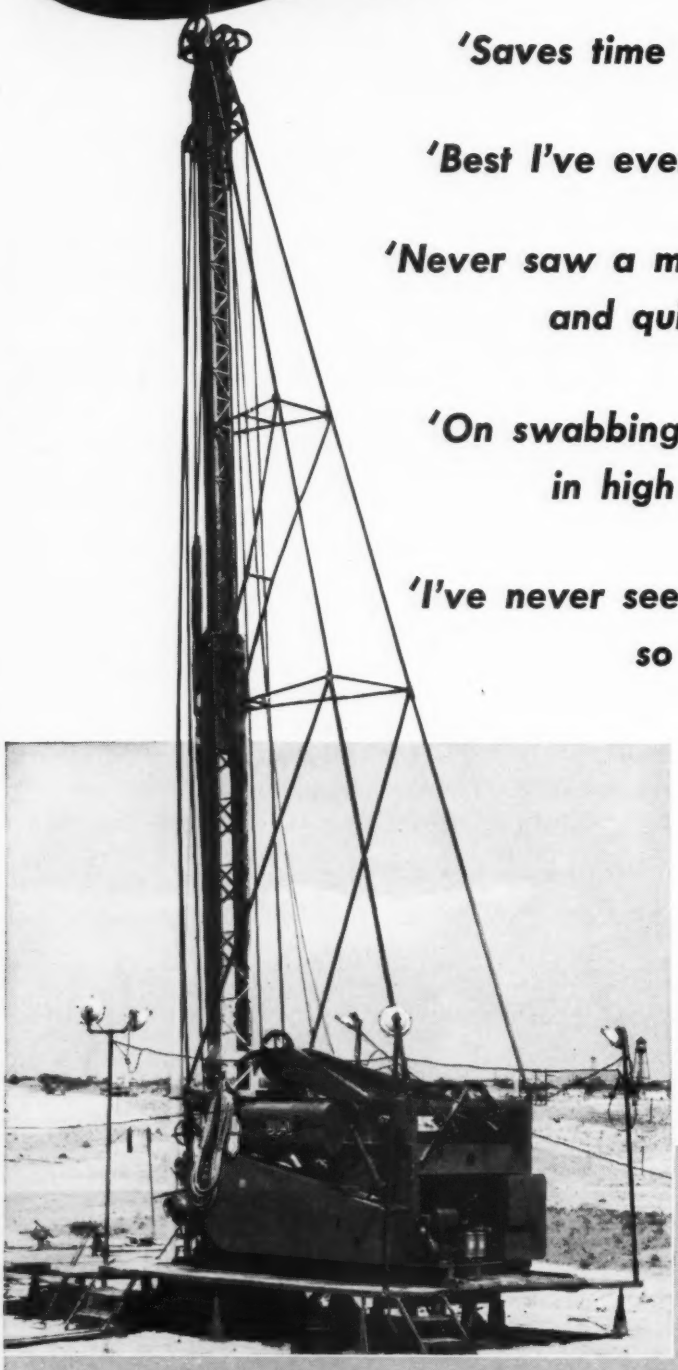
'Saves time in moving and rigging up'

'Best I've ever had for handling pipe'

'Never saw a machine operate so smoothly and quietly'

'On swabbing, brings out a load of oil in high gear'

'I've never seen anything handle tools so well at such depths'



These actual words, spoken about Bucyrus-Erie spudders by experienced, successful oil well contractors, tell just a few of the many reasons why Bucyrus-Erie spudders have proved their superiority in oilfields everywhere. Investigate the Bucyrus-Erie line of spudders and learn about the many features that are paying off in profits for hundreds of owners. Bucyrus-Erie Company, South Milwaukee, Wis.

43548

There's a Bucyrus-Erie spudder for each of these ranges

	Top-to-bottom drilling	Servicing
24-L	1500 ft.	2000 ft.
28-L	2500 ft.	3000 ft.
36-L	3500 ft.	4000 ft.
48-L	6000 ft.	7000 ft.

See Your BUCYRUS ERIE *Spudder Distributor*

TIMKEN CARBON STEEL TUBING Generally for service not exceeding 900°F. where corrosion and oxidation resistance are not important.

TIMKEN CARBON-MO STEEL TUBING For temperatures up to 1000°F. Improved creep strength makes it safer than carbon steel.

TIMKEN DM STEEL TUBING For service up to 1150°F. This steel offers outstanding creep strength.

TIMKEN 2% CR ½% MO STEEL TUBING For service up to 1150°F. Intermediate corrosion resistance plus good creep strength, fair oxidation resistance.

TIMKEN SICROMO 2 STEEL TUBING For service up to 1200°F. where better scale resistance is required than can be obtained with 2% Cr. ½% Mo. Steel.

TIMKEN 2¼% CR-1.0% MO STEEL TUBING For service up to 1150°F. Has greater resistance to creep than 2% Cr. ½% Mo. Steel.

TIMKEN SICROMO 3 STEEL TUBING For service up to 1200°F. Has excellent oxidation resistance and good corrosion resistance.

TIMKEN 4-6% CR MO STEEL TUBING For service up to 1200°F. Superior corrosion resistance. Less oxidation resistance than Sicromo 3.

TIMKEN SICROMO 5 S STEEL TUBING For oxidation resistance to 1500°F. Good creep strength and corrosion resistance to 1300°F.

TIMKEN SICROMO 7 STEEL TUBING For applications requiring better corrosion resistance than can be obtained with 5% Chromium type steels.

TIMKEN SICROMO 9 M STEEL TUBING This steel possesses the maximum corrosion resistance of any of the steels below the stainless group.

TIMKEN 18-8 STEEL TUBING Shows the best combination of creep strength, oil corrosion resistance and oxidation resistance up to 1500°F.

Look into these 12 high temperature steels for a better LIFE/COST ratio

EACH of the 12 high temperature steels above was specially developed to meet particular high temperature requirements involving heat, pressure, corrosion, and oxidation.

One of them was made to provide the best possible life/cost ratio for operating conditions like yours.

To get the right steel for your job, plus *maximum tube life per dollar invested,* call in the metallurgists of The Timken Roller Bearing Company. Nineteen years' experience and research have made them the recognized experts on high temperature tubing applications. They can help you select the steel with the combination of properties best suited to your requirements.

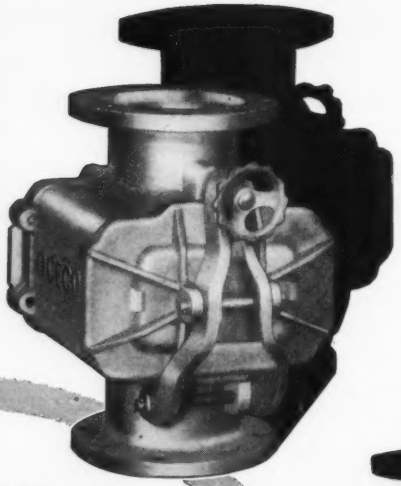
Uniformity of the analysis you decide upon is assured from shipment to shipment because every step in production is completely controlled by the Timken Company, from melt shop through final inspection.

Our Technical Staff will be glad to make a study of your operation with no obligation to you. For further information, write for a copy of "Facilities and Products". The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO."

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

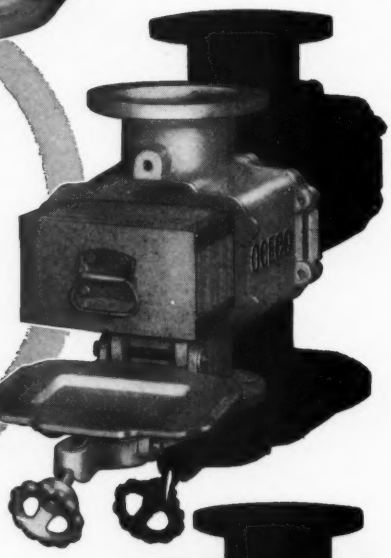
Oceco 2" Flame Arrestor Showing Screw Mounting and Side Hinge.



Oceco 6" Flame Arrestor Showing Flange Mounting and Bottom Hinge.

OCECO
FLAME ARRESTORS
for outstanding performance

Below—View of Oceco Type "F" Fixed Bank.



Above—View of Oceco Type "E" Extensible Bank.

● Oceco Flame Arrestors—have won outstanding recognition throughout the entire petroleum industry. They combine the desired flame stoppage and explosion prevention with minimum pressure drop.

Housings and covers are semi-steel castings, with high melting point and consequently provide substantial heat resistance and protection to the flame arrestor "bank", even when subjected to the intense heat of sustained fire.

The "banks" consist of flat and corrugated sheets of high purity, corrosion resisting aluminum arranged alternately to form vertical straight through passages. They are of sufficient depth, top to bottom, to resist "burning through",—and the straight through passages minimize depositing of moisture and clogging;—and simplify inspection.

Furnished in 2" and 3" sizes for screw mounting and 4", 6", 8" and 10" sizes for flange mounting;—with either type "F" fixed banks, or type "E" extensible banks, that permit the plates to be separated for individual cleaning. Send for Bulletin No. 471. It gives full details.

OCECO

Division of THE JOHNSTON & JENNINGS CO.

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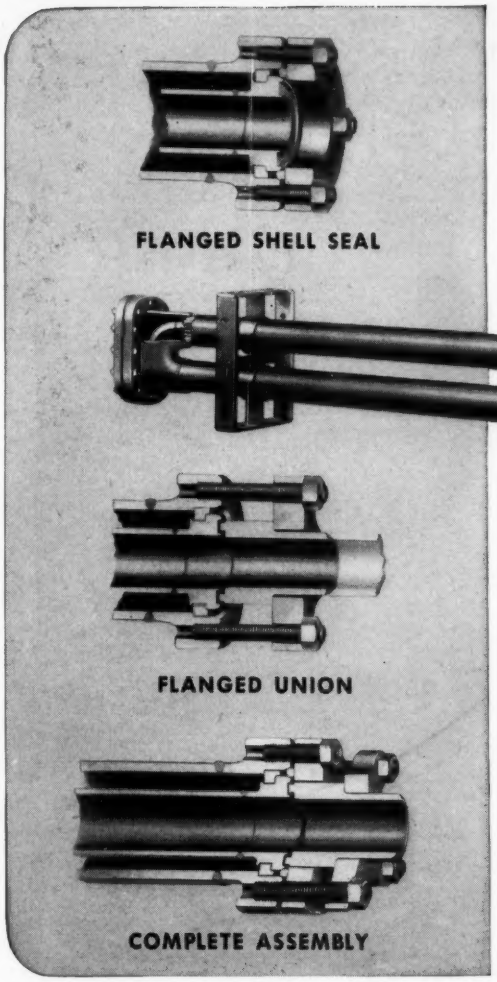
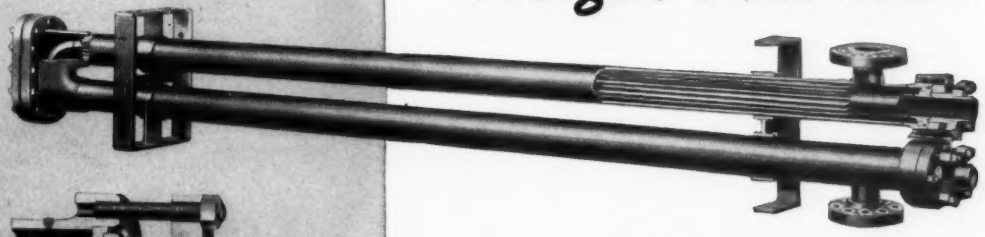


BROWN FINTUBE'S *Flanged Shell Seal*



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Sectional Hairpin

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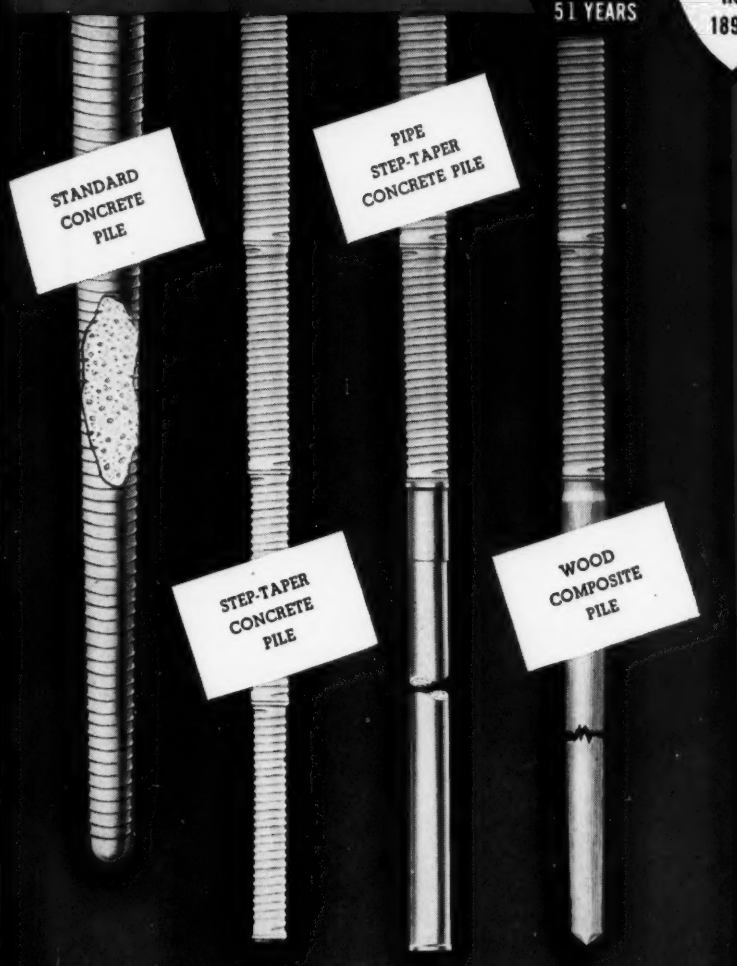

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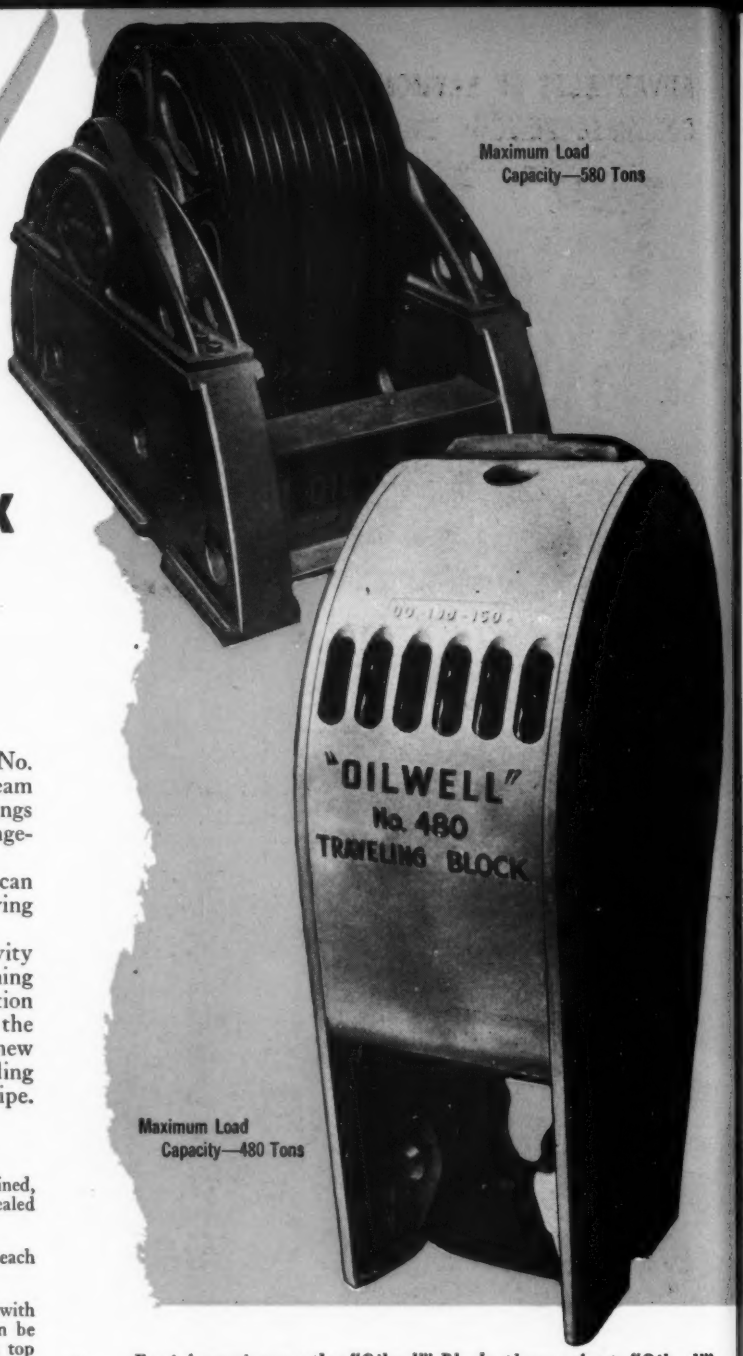
"OILWELL" No. 580 CROWN BLOCK

and its companion

No. 480 TRAVELING BLOCK



Maximum Load Capacity—580 Tons

Maximum Load Capacity—480 Tons

THE NEW "Oilwell" No. 580 Crown Block and No. 480 Traveling Block form a safe, dependable team with a favorable ratio of strength to weight. Bearings and sheaves are identical and completely interchangeable.

Due to its narrow design this new Crown Block can be easily installed in one piece which is a time-saving advantage.

The balanced design with low center of gravity keeps the Traveling Block vertical even when running light at high speeds. Safety streamlined construction and free running sheaves make it possible to run the block as fast as the crew can handle the pipe. This new Traveling Block is short, as well as narrow, affording maximum space in any derrick for handling the pipe.

IMPORTANT ADVANTAGES

BEARING TYPE—Both Blocks are equipped with self-contained, dual-roller type bearings having side thrust capacity and sealed grease lubrication.

LUBRICATION—Grease, through individual connections to each bearing of each block.

FEATURES—Traveling Block is narrow, compact, streamlined, with no projections . . . has fully enclosed safety guard and can be strung without removing the guard . . . rubber bumper on top protects sheaves . . . will stand upright on derrick floor without tipping.

SPECIFICATIONS

DESCRIPTION	CROWN BLOCKS	TRAVELING BLOCK
Maximum Load Capacity	580-Tons	480-Tons
Number of Sheaves	7	6
Outside Diameter of Sheaves	50"	50"
Wireline Size	1¼"	1¼"
Centerpin Diameter	12"	12"
Overall Width	4'-2"	2'-5¼"
Overall Length	8'-0"	.....
Overall Height	4'-11"	7'-9¼"
Maximum Diameter Across Guard	....	4'-3¾"
Distance—Centerpin to Top	2'-1"	3'-0¼"

For information on other "Oilwell" Blocks please refer to "Oilwell" Booklet No. 5C-1047. Or inquire at the nearest "Oilwell" Store for complete specifications and detailed information of all Blocks in the "Oilwell" line.

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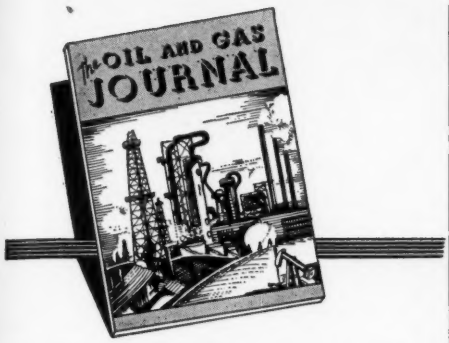
UNITED STATES STEEL



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JOURNALLY Speaking

Grass Roots

NOT long ago a popular magazine did a picture spread on life among the new-rich oil men in the Southwest, which didn't please the region nor the oil industry very much.

Now a certain oil millionaire in Houston is getting his name in the papers by paying $5 parking tickets as fast as the police can put them on his shiny new Cadillac just because he thinks it is worth it to park in the bus stop in front of his office building every day.

What the police, the bus riders, and legally parked motorists think of rich oil men is doubtless unfit to print. All of which may explain why a good many members of the A.P.I. public relations committee believe that four-color ads in the slick magazines are a waste of money unless everybody down the line in the oil industry exemplifies the proper public-relations spirit and applies the program at the grass roots.

When the late John D. Rockefeller, Sr., found that the public looked upon him as a monster he hired a high-powered publicity man, gave away dimes and college buildings, and spent quite a few of his millions building himself up in public esteem. He lived long enough to make his personal public-relations program a success.

But the oil industry is still suffering from the opinions regarding the original Standard Oil Co. formed by the public more than a generation ago. It would seem that the advocates of grass-roots public relations have a point or two on their side.

Where There's Smoke

A NEWS dispatch from Sweden says that "burning water" in a swamp has started an oil rush in that country.

This may bring sneers from our cautious, calculating young scientists who have been trained to use every super-scientific device before locating a drill test, but we wouldn't be too surprised to find some of the old-time wildcatters slipping over on the next boat. There was a grain of truth in that apocryphal yarn about the deceased oil man, denied admission to heaven on the ground that his occupational quota was full, who made room for himself by spreading the rumor that oil had been struck in hell and then told St. Peter he guessed he'd be leaving too because there might be something to the rumor after all.

With the Greatest of Ease

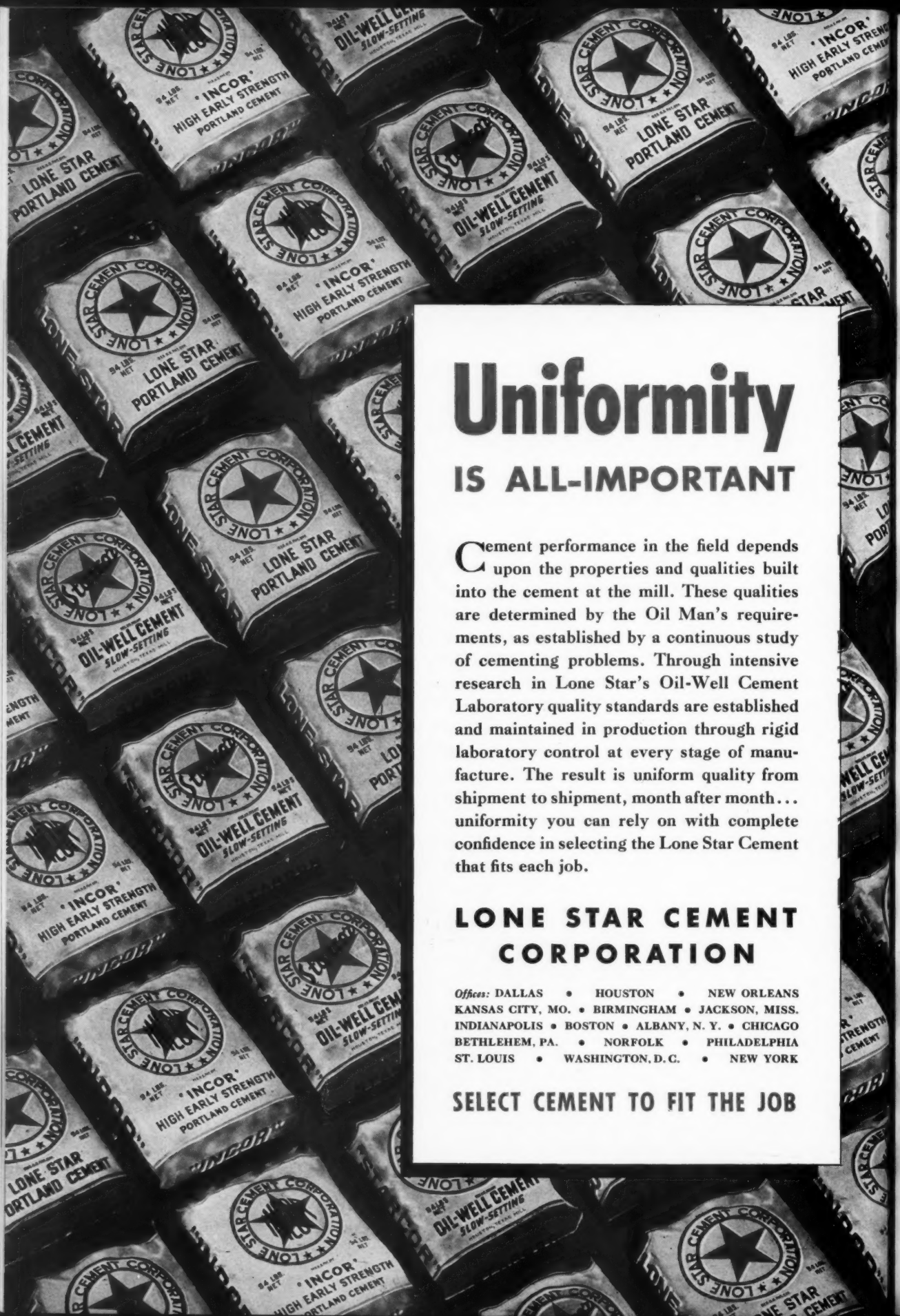
RINGLING BROTHERS' acrobats now fly through the air free from nasty burns caused by shinning up those rough manila ropes, thanks to the typical resourcefulness of the oil industry.

Seems the circus folks asked Socony-Vacuum to mix them up a grease or something to protect the hands of their aerial artists. No petroleum product filled the bill exactly, but that didn't stump the oil men. They dug out a lot of old tubular lamp wicks, left over from the days when Socony-Vac.'s predecessors were peddling kerosine lamps to build up a market for oil, and threaded the ropes through the wicks. Just as simple as that. Works fine, too, the circus men say.

Future Tidelands

PETROLEUM for future eons is probably being manufactured drop by drop by the tiny animals that form coral reefs, according to a press release from the American Chemical Society which quotes Prof. Werner Bergmann of Yale to the effect that coral contains a wax which might easily be converted into petroleum by a slight shift in geological conditions.

Most any day now we expect Ickes to come out with a demand that the Supreme Court set aside the South Pacific as a naval petroleum reserve so that posterity can get this coral oil before it is gobbled up by the greedy oil companies.



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SELECT CEMENT TO FIT THE JOB

THE OIL AND GAS JOURNAL

Sliding Past Third

WE attended a ball game last summer in which the fastest runner of one team made a safe hit in the ninth inning. It was an easy double but a run was badly needed and the runner went on to third. He would have been safe but he was going too fast and slid past the base and was tagged out before he could return. The game ended there.

In its anxiety to assure that every petroleum want is supplied everywhere there is danger that the oil industry will have too much momentum when it comes to its own third base. Going back a few months ago, the oil industry could have slowed up, played safe, and stopped at second. Not all the oil demands would have been supplied last summer and this winter, but the industry would have enjoyed tight markets in all divisions.

The oil business does not play that way. It is nearing third and all requirements have been supplied. It has accomplished its objective. But now it must make sure that it has its operations under control and does not provide excess output for one or more of its markets.

The postwar record up to now is generally known and needs not be detailed here. The expansion in demands has been phenomenal and in no industry is the outlook more promising. The largest gains over the past 7 years have been in the heavier products, which compared to the same period in 1941 include: distillate, 93.7 per cent, and residual fuel oil, 34.4 per cent.

These upward trends continued this year over 1947 with the exception of residuals and for them the domestic demands decreased 1.2 per cent. There are reasons for this and the net result is that fuel-oil prices have reflected weakness in most markets in this and other countries. Some are inclined to minimize the significance of this development by pointing out that heavy fuel oil generally represents less than 25 per cent of the plant output and is a minor factor in total revenue at most refineries.

But with today's processing methods, residuals are not only fuel but they are raw materials for the manufacture of other petroleum products. Low prices for residuals mean that larger percentages will be converted into distillates, gasoline, and other products through additional distillations and cracking. Some modern plants are now being operated with practically no liquid residuals. Obviously this increases the supply of other products and reduces the demand for crude oil. This explains why weakness in petroleum markets invariably start with residual oils.

The first responsibility in making adjustments to take care of these inevitable shifts in demand rests with refiners. Required changes in production operations should follow. These are the primary steps in making certain that the oil industry balances total output and demand and thus avoids the possibility of sliding past third.

Operators Seek Court Action to Stop Shutdown of 16 Gas Fields in Texas

by Leigh S. McCaslin, Jr.

HOUSTON.—The Railroad Commission has ordered operators in 16 Texas oil fields to shut in all their wells where the produced gas is not being put to "lawful use." Effective date of the orders is December 1.

Operators were quick to react and by the week's end suits had been filed to block the commission's orders as to seven of the fields. The injunctions were sought in the Ninety-eighth District Court in Austin. First hearing is scheduled for Heyser field on November 30 by District Judge Charles O. Betts.

In announcing the orders, E. O. Thompson, chairman of the commission, said: "It was testified at the show-cause hearing recently held by the commission that there is now an ample market for flare gas; therefore, the commission sees no further reason for not requiring that this gas be used for a lawful purpose. . . . These are waste-prevention orders."

Murray Dissents

Railroad Commissioner William J. Murray, Jr., disagreed with his two fellow commissioners on 4 of the 16 fields involved and declined to sign the orders. The fields were Slaughter, McElroy, Levelland, and La Gloria. In a public statement he said: "I have signed 12 of the 16 shutdown orders, but have differed with my colleagues on the effective date for these orders. While the gas which would be wasted during the few months' time required for compliance with the order would have been extremely regrettable, I have learned with some bitterness the necessity of patience during the past several years, and I would have been willing to wait a few months longer in order to see the attainment of a long-cherished goal."

For an unannounced reason, North Cowden field, which was one of the 17 involved in the October 26 hearing, was not among those ordered to shut down.

Each of the 16 orders specified that where gas produced from any well is used for legal purposes, that well is excluded from the provisions of the order. However, the burden of the proof that such gas is being legally used is on the operator of the well. Legal uses for gas were defined as follows: (1) light or fuel; (2) efficient chemical manufacturing other than the manufacture of carbon black; (3) bona fide introduction of gas into oil or gas-bearing horizons in order to maintain or increase the rock pressure, or otherwise increase the ultimate recovery of oil or gas from such horizons; (4) extraction of natural gasoline therefrom when the residue is returned to the horizon from which it is produced; and (5) in addition to the purposes for which sweet gas produced from a gas well may be used, sour gas may be used for efficient chemical manufacturing purposes including the manufacture of carbon black provided it is utilized in a plant producing a recovery of not less than 1 lb. of carbon black to each 1,000 cu. ft. of gas, and provided further that the gasoline content is removed and saved from such sour gas before the same is utilized for carbon black.

A total of 10,025 wells and approximately 400,000 bbl. daily production is represented by the 16 fields. In its orders, the commission charged that 309,787 M.c.f. of gas daily was being vented in the 16 fields. (No estimate was made for the Tijerina-Canales-Blucher field.)

Action Called Arbitrary

The seven suits filed to restrain the commission were as follows: Texas Pacific Coal & Oil Co. et al, Fullerton field, Andrews County; Honolulu Oil & Gas Corp. et al, Slaughter field, Hockley and Terry counties; Stanolind Oil & Gas Co. et al, Levelland field, Hockley County; Flour Bluff Oil Corp. et al, Flour Bluff field, Nueces County; Humble Oil & Refining Co., Tijerina-Canales-Blucher field, Kleberg and Jim Wells counties; Magnolia Petroleum Co. et al, La Gloria field, Jim Wells and Brooks counties; and Sterling Oil Co. et al, Heyser field, Calhoun and Victoria counties.

The first suit filed, that for Heyser field, declared that the commission's order was "illegal, unjust, unreasonable, arbitrary, and discriminatory against the plaintiffs," that it was physically impossible to comply with it until additional compression facilities now under construction in the field are completed, and that production stoppage would deprive the public and the armed forces of needed supplies of oil and products.

Summarized below, field by field, is the evidence included in the commission orders as to status of the fields affected. In parenthesis is given the gist of evidence presented by the operators in defense of their position. This information is based upon the operators' testimony at the October 26 hearing and also on the petitions of the suits filed to block the commission's orders.

South Caesar, Southwest Texas: As of October 26 there were 36 producing oil wells of which 21 were producing from the Luling sand and 15 from the Slick sand. Daily average casing-head gas produced is better

Suits Pour in Against Commission Gas Orders

The Railroad Commission has rescinded one of its 16 shutdown orders and issued a more lenient directive on the field involved. In the new order operators in Foster field, Ector County, have had their allowable reduced from 25,347 bbl. daily to 20,278 bbl. This followed testimony by the operators that they could produce 20,278 bbl. without wasting natural gas. In the order it was noted that 10 of the field's 650 wells are isolated and since it would be uneconomical for them to tie into gathering systems they would not be affected.

Meanwhile, lawsuits continue to pour into the Ninety-eighth District Court in Austin. Additional suits filed include: The Texas Co. and nine other plaintiffs on Magnet Withers field, Wharton County; The Texas Co. on North Withers field, Wharton County; Sun Oil Co. for Levelland field, Hockley County; Amerada Petroleum Corp. et al, Seminole field, Gaines County; and McElroy Ranch Co. et al, McElroy, Crane, and Upton counties. Temporary restraining orders preventing the shutdown on December 1 have been granted in some cases. All the suits are scheduled for hearings this week.

than 12,000 M.c.f., and 17 of the field's 36 wells have gas-oil ratios in excess of 2,000. All of the casing-head gas, as of October 26, was being vented to the air and that the volume thereof during September averaged 12,000 M.c.f. daily.

(A pipe line has been laid, and United Gas Corp. has agreed to take the gas now flared. Sales are expected to start in the near future.)

Heyser, Southwest Texas: As of October 26 there were 185 producing oil wells. Humble Oil & Refining Co. and Plymouth Oil Co. operate the gas-processing plant and 149 of the 185 wells are connected to it. Daily average casing-head gas produced is better than 27,000 M.c.f., and 110 of the field's wells have gas-oil ratios exceeding 2,000. As of October 26 all residue gas from the plant was being vented and during September this gas averaged 21,137 M.c.f. daily. Operators have had contract with Tennessee Gas & Transmission Co. since 1946 to purchase this casing-head gas.

(A $2,000,000 plant under construction will permit in April the sale of gas presently being flared.)

North Withers, Upper Gulf Coast: As of November 15 there were 151 producing oil wells, and in excess of 7,000 M.c.f. of gas daily is being flared.

(Low liquid content discourages saving of gas in North Withers and Magnet Withers, but equipment has been ordered and plans are under way to compress all gas in both fields. Possible disposition will be to a transmission line.)

Magnet Withers, Upper Gulf Coast: As of November 15 there were 250 producing oil wells and approximately 10,000 M.c.f. of gas daily being flared. United Gas Co. is presently willing to take all flare gas from this field.

(See North Withers for company plans.)

La Gloria (all zones), Lower Gulf Coast: As of November 26 there were 166 (including dual completions) producing oil wells and average daily casing-head gas production was better than 14,000 M.c.f. of gas daily. Thirty-two of the field's 166 wells have gas-oil ratios above 2,000. All gas was being vented as of October 26.

(A $2,500,000 absorption plant is under construction and will be completed by April or May.)

Flour Bluff, Lower Gulf Coast: As of November 15 there were 65 producing oil wells of which 90 per cent are operated by Humble Oil & Refining Co. Humble operates a gas-processing plant in the immediate area and all wells are tied into the plant. All of the residue gas, as of November 15, was being flared and this gas averaged 11,699 M.c.f. daily during October.

(Continued on page 155)

Senate Resources Study Postponed Indefinitely

WASHINGTON.—The first definite effect of the recent election upon congressional activities was the calling off last week of an exhaustive study of the fuel situation planned by Sen. George W. Malone of Nevada, chairman of the national resources economic subcommittee of the Senate interior and insular affairs committee.

The study of the "fuels position of the United States" was originally scheduled to open with hearings October 5 and was postponed until January 18, but it was announced by Sen. Joseph C. O'Mahoney of Wyoming, ranking Democratic member of the committee who will be its chairman in January they "will not be held as planned."

O'Mahoney explained that, for one thing, the new committee which must be set up as a result of the election has not been organized and the new members who may be assigned to it next year have not yet been selected.

For another thing, he said, the Hoover commission is now in the process of preparing its report on government reorganization and one of its task forces have given considerable attention to the organization of the Interior Department and the minerals problem and may have something of importance to say that will guide the committee in its considerations.

Malone announced the postponement of the hearings in September in order, he said, to give additional time to the federal departments and the petroleum, gas, and coal industries for the preparation of testimony. Earlier he had said the inquiry would go into every phase of the fuels situation, a subject which was exhaustively discussed last session by a number of committees in both Houses and on which the House interstate commerce committee is expected to have a detailed report in January.

Humble's Wildcat Makes Fourth Offshore Field

HOUSTON.—Fourth oil field in open waters of the Gulf of Mexico has been brought in 5½ miles offshore from Caminada Pass, La., at the west end of Grand Isle.

The latest wildcat strike in the big offshore drilling program currently under way was drilled by Humble Oil & Refining Co. It is 6¼ miles west of another oil discovery made by the same company last summer.

On a 4-hour test, the well flowed at the rate of 182 bbl. daily through 5/32-in. choke. Tubing pressure was 840 psi. and gas flow was 88.6 M.c.f. daily for a gas-oil ratio of 487. Description of the test is Humble A-1 State Lease 799, Caminada Pass Account No. 4, in Block 16, state tract 1114.

The well was drilled with a converted L.S.T. in combination with a permanent piling platform. Humble will start a second well from the platform immediately. The company is barging oil ashore from its first discovery and probably will use the same method at present for producing the latest strike.

Humble officials announced that efforts are now being made to complete another offshore oiler at its 1 Tiger Pass. This test is approximately 25 miles east of the Caminada Pass discovery.

The three previous offshore oil discoveries have been made by Humble, The California Co., and the combination of Phillips Petroleum Co., Kerr-McGee Oil Industries, Inc., and Stanolind Oil & Gas Co.

Humble's Caminada Pass discovery well

Anomalous Crude-Price Situation Caused by Sinclair's Increase

THE crude-oil market today presents the virtually unprecedented picture of a dual price schedule, with two major purchasers paying 35 cents per barrel more than the prices posted by competitors in many important fields throughout the Mid-Continent area.

This came about on November 24 when Sinclair Prairie Oil Co. and Sinclair Wyoming Oil Co. announced that they were meeting the 35-cent advance made by Phillips Petroleum Co. September 28. In the meantime only a few small purchasers had met Phillips' price.

During the week following the Sinclair announcement no other major purchaser gave any indication of meeting the increase, though it was met by some smaller companies.

The latest companies to meet the advances were Johnson Oil Refining Co. operating a 5,000-bbl. refinery at Cleveland, Okla.; Malco Refineries, Inc., with a 2,500-bbl. refinery at Roswell, N. M.; and New Mexico Oil & Refining Co. with a 4,000-bbl. refinery at Artesia, N. M.

Affects 525,000 Bbl. Daily

Reports the first of the week indicated that the higher price was being paid for approximately 525,000 bbl. daily of crude oil. Deducting California and eastern production where there have been no price changes the output effected by the 35-cent advance amounts to about 12 per cent of the total in the Southwest, Middle West, and Rocky Mountain areas.

In 1947 according to its annual statement the operating companies of Sinclair Consolidated Corp. (holding company) produced about 100,000 net bbl. of crude oil daily of which about 20,000 bbl. daily was produced in Venezuela. Its refineries, all of which are located in the United States, refined an average of 246,548 bbl. daily. It is understood both the company's crude-oil production and refinery runs this year are slightly greater than in 1947. As in the case of other major companies, Sinclair both sells and buys crude oil and it is estimated that its purchases to which the 35-cent advance applies total about 185,000 bbl. daily.

Phillips and Sinclair are now posting $3.00 per barrel for all East Texas crude and for crude of 40°-gravity and above in Oklahoma, Kansas, and most other fields where they purchase. The Sinclair move extended the price increase into the northern Rocky Mountain area, and it was immediately met in three Montana fields by Phillips which previously had not extended its higher price there.

Sinclair is a larger buyer than Phillips and its purchases are more widespread, a fact which may have considerable influence on the competitive situation.

O. C. Schorp, president of Carter Oil Co., Tulsa, said: "In view of the increasingly favorable over-all crude-oil supply situation at generally prevailing price levels, we see no justification for price increases instituted by others. Our supply position is satisfactory, and so long as this continues to be the case, Carter Oil Co. does not plan to change its price postings."

D. B. Hodges, vice president of Shell Oil Co., Inc., New York, said: "In view of what we know of the availability of crude, we are completely surprised that anyone has found it necessary to increase prices at this time."

Officials of most major purchasers said nothing at all for publication. But observers wondered how long the dual-price anomaly could continue. Phillips and Sinclair together purchase substantial amounts of crude in a great many fields in Oklahoma, Kansas, Texas, Wyoming, and Montana, and in most of these fields they are in direct competition with buyers with lower postings.

The 35-cent differential is so high that it was felt these two companies could not continue it long without raising the prices of their products. It was also so high that additional producers were threatening to shift connections to these two companies wherever physically possible. It is understood that both Phillips and Sinclair have picked up many new connections and that other producers have served notice on their purchasers that they will switch unless the increase is met by certain dates.

The expiration of these notices may tip the balance. If an excessive volume of crude is thus lost to other major purchasers, the losers would be forced to meet the advance in order to maintain their refinery runs. On the other hand, if these majors are able to withstand such loss of crude the companies with higher prices probably would not be able to hold their schedules indefinitely.

The present weakening condition of the market for some petroleum products, probably heavy fuel oils, is cited by many as a factor making it inadvisable or perhaps impossible to increase products prices to compensate for a 35-cent increase in the price of crude.

In announcing the new price postings, the following statement was issued by Henry L. Phillips, president, and William L. Connelly, chairman, of Sinclair Prairie:

"Sinclair Prairie Oil Co. and Sinclair Wyoming Oil Co. announced that effective at 7 a.m. November 24 it would increase its posted price for crude oil in all areas in which it is buying, by 35 cents per barrel.

"The main reason for meeting the increased price of crude oil posted by another purchaser on September 28, last, is that we needed additional crude and found it impossible to buy it unless we agreed to pay the higher price. Investigation in principal producing areas over the past 2 months convinced us that no change in this situation could be expected. It is a matter of common knowledge in the industry that the practice of paying premiums above posted field prices has been widespread.

"To replace the crude oil we are consuming at an ever-increasing rate can be accomplished only at greatly increased costs. Exploration, drilling, steel, transportation, and labor costs cannot be expected to decline, but rather to increase. In other words, to obtain all the oil that the industry requires to satisfy the demand makes it necessary to pay more for crude oil.

"In common with many other large purchasers, we believed a price increase undesirable mainly because it would lead to increased prices for petroleum products. But in the light of the facts here stated, we have been forced to the conclusion that it is necessary to increase crude-oil prices by 35 cents a barrel in the areas where we purchase in order to retain our present connections and enable us to secure the additional amount of crude oil necessary for our refinery operations."

Mid-Continent Association Plans Ad Valorem Tax Forum

The Mid-Continent Oil and Gas Association will hold its annual ad valorem tax forum at the Blackstone Hotel, Fort Worth, December 16-17. Agenda of the forum will cover state and local tax trends of general nature, and will incorporate various subjects of special interest to those oil-company tax representatives who are engaged in state and local tax fields.

Among those who will speak are: Alva Brumfield, chairman, Louisiana Revenue Code Commission, Baton Rouge, La.; Charles Vance, attorney, Liberal, Kans.; and Charles B. Randall, tax attorney, Natural Gas Pipe Line Co. of America, Chicago.

_____this week

PRODUCTION—Sinclair raises price of crude by 35 cents per barrel, only major meeting increase maintained by Phillips since September 28. . . . Differential now being paid on 12 per cent of crude produced in several states. . . . Dual price condition unprecedented in production history. . . . ¶Operators rush to courts to enjoin Texas Railroad Commission from enforcing shutdown orders against 16 important fields. . . . ¶Fourth offshore oil field proved in Gulf. . . .

GOVERNMENT—State attorneys general map fight to retain state control of offshore oil development. . . . Optimistic over favorable action by new Congress. . . . ¶Krug says danger of oil shortage not over. . . . Argues this requires production of more tubular goods. . . . ¶Federal agencies plan to ask Congress to start synthetic-fuels program, extend trade agreements and export control laws. . . .

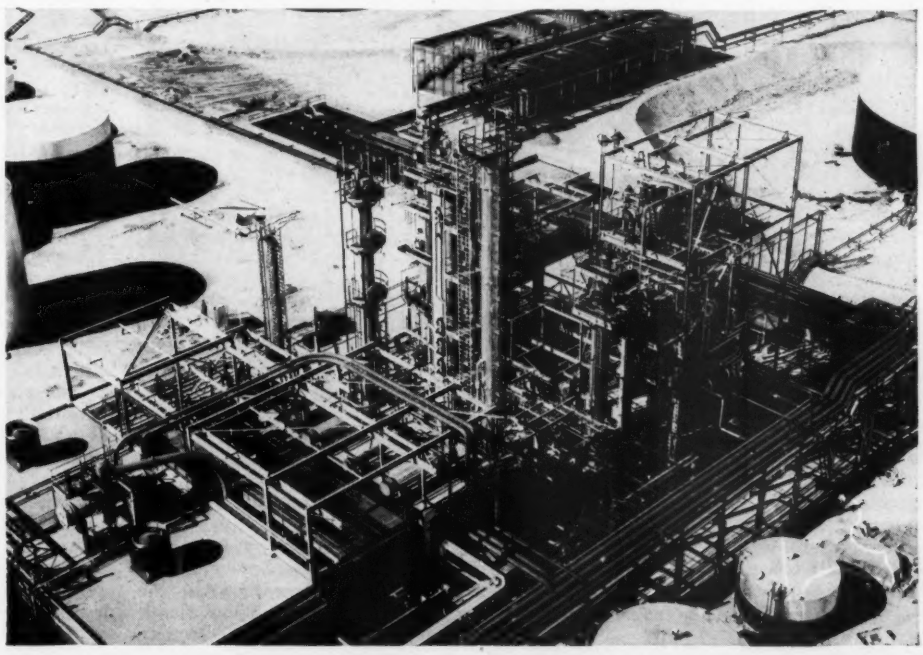
INTERNATIONAL—Venezuelan Government overturned by military coup. . . . No interference with oil operations is seen. . . . ¶Danish Government questions validity of exploratory concession of Danish American Prospecting Co. but company continues wildcatting program. . . . ¶Canadian customs, exchange controls, and trade restrictions complicate oil operations of American firms. . . . ¶Government of Iraq and I.P.C. negotiating proposed changes in concession and royalty provisions. . . .

TRENDS—Crude-oil production for week ended November 27 averages 5,620,780 bbl. daily. . . . Reflects seasonal drop of 35,855 bbl. from previous week. . . . Kansas and Wyoming account for biggest decline. . . . Colorado sets new high in production for year. . . . ¶Stock level of four major products for 6 weeks ended November 20 shows gain of 12,604,000 bbl. . . . For similar period last year stocks were up 1,779,000 bbl. . . . Gasoline and kerosine stocks show decline for 6-week period this year. . . . Big gain shown in distillate and residual oil. . . . In 6-week period last year increases in stock level were in gasoline and distillate. . . . Kerosine and residual were down. . . . ¶Some observers say crude advance not advisable. . . . Point to weakening products market, high crude production, and high stock levels. . . .

NATURAL GAS—McCarthy Chemical Co. opens big plant to make chemicals from natural gas. . . . ¶No shortage of L.P.G. foreseen in Texas this winter. . . . ¶Federal court rules gas export not controlled by Natural Gas Act. . . . Border Pipe Line Co. not subject to FPC regulation. . . . ¶Texas Panhandle producers get higher prices for natural gas. . . . ¶General Crude Oil Co. declared not a "natural gas company." . . .

PIPE LINES—Trans-Continental will substitute 30-in. for 26-in. pipe in 1,210 miles of its Texas-New York pipe line. . . . Also has approval for shifting its incorporation from Texas to Delaware. . . . ¶Mississippi River Fuel Corp. asks to build third line to northern Illinois. . . . ¶Cities Service's Ulysses-Hutchinson 26-in. line is 6 miles from completion. . . . ¶Interstate uses aluminum pipe to transport sour crude in Arkansas. . . . ¶Gulfcoast Natural Gas Co. clarifies plans for new line from Texas. . . .

REFINING—Enlargement of Continental's Denver plant nearly complete. . . . New units including catalytic cracking, vapor recovery and gasoline stabilization, catalytic polymerization and L.P.G. facilities nearly double plant's former capacity. . . .



A view of portions of new construction at Continental Oil Co.'s Denver refinery. In the left foreground is the gas plant, center foreground is the liquid petroleum gas plant, right is the catalytic polymerization unit, and in the center background is the cooling tower. New construction will almost double the plant's capacity as explained on page 125 of this issue

Tubular-Goods Program Needed to Prevent Oil Shortage, Krug Says

by Bertram F. Linz

WASHINGTON. — Interior Department officials are still apprehensive over the possibilities of an oil shortage this winter.

Their fears that a colder-than-average winter, a major strike or disaster, increased military demand, or other unpredictable happenings might upset the balance between supply and demand were disclosed this week with release of a letter written by Secretary J. A. Krug to Commerce Secretary Charles Sawyer when the steel products advisory committee met with the latter November 19 to discuss the oil industry's proposals for voluntary allocations.

If it were true, as charged by some steel men, that "we have oil running out of our ears," Krug said, and if there was no possibility of a fuel-oil shortage this winter the department would eliminate the oil industry's voluntary agreement, the state oil coordinators, the presidential order to government agencies to save oil and gas and prevent conversions from other fuels, the rigid export controls on oil, and the Government's appeals for conservation.

"We have eliminated none of these things," Krug declared. "We dare not. Supply and demand are in approximate balance, but the balance is precarious."

From the national security standpoint, we have lost ground this past year, Krug asserted, pointing out that instead of domestic supply equalling domestic demand, we are a net importer of 100,000 bbl. per day.

More Drilling Needed

"Every effort should be made to erase this deficit and to increase production above demand to help carry the energy load of an emergency," he said. "We should have at least 1,000,000 bbl. a day excess productive capacity to fuel another war. We can only get it by drilling more wells. We cannot drill more wells without more oil-country goods.

"Equally important, to both the domestic economy and national security, is pipe for oil and gas lines. Little is gained by increasing output of crude oil or products unless adequate pipe lines are provided to move the crude oil to refineries and to move products from the refineries to centers of distribution.

"Our manufacturing capacity, of critical importance in both peace and war, is increasingly dependent on an adequate supply of natural gas, much of which is used for purposes for which coal will not serve. We have adequate reserves of natural gas in the Southwest; we need pipe lines to move the gas to the industrial centers of the East and Middle West.

"Thus we need more tubular goods in both categories: oil-country goods (drill pipe, casing, and tubing) and line pipe."

Krug based his position on a memorandum submitted by Russell B. Brown of the Independent Petroleum Association of America, chairman of the National Petroleum Council's committee on steel requirements, in which he disclosed that the industry is increasing its production at the rate essential to keep pace with demand only by resorting to uneconomic practices and with some loss of recoverable reserves.

The experience of the industry, Brown said, indicates that approximately 1,510,000 tons of oil-country goods will actually be used in the drilling of 39,000 wells this year, an amount 160,000 tons more than the reported mill shipments for domestic use. The question naturally arises, he added, as to how the industry is able to drill these wells with the indicated shortage of casing, tubing, and drill pipe.

"This has been accomplished by a combination of abnormal practices, many of which are unsound and inflationary," Brown explained. "Producing wells have been prematurely abandoned in order to recover and use the second-hand materials. In addition, an undetermined but large volume of tubular goods has been obtained through the so-called 'gray market' and, in addition, through the increasing use of 'conversion methods' whereby the oil producers are forced to purchase steel in the form of ingots, tube rounds, etc., and arrange for shipment and further processing of these raw materials.

"Most of the devices that have had to be adopted result in the price of stell tubular goods ultimately paid by the oil producers being from 100 to 200 per cent above the mill price of these goods, imposing a heavy inflationary burden upon oil-producing operations in this country."

Export Control Law May Be Extended For Life of European Aid Program

WASHINGTON.—Strong support is being given a recommendation that President Truman include in his message to Congress next month a request for continuation of the export control law for at least the next 3 fiscal years.

Such an extension would carry the act through the life of the Marshall plan, enabling the Government to continue to channel exports of scarce materials and commodities to those countries where they will make the greatest contributions to world economic recovery.

An export control law has been in force since July 1940, since the end of the war being renewed periodically as part of the administration's postwar economic program. Last year it was tied in with Public Law 395, which permits the voluntary allocation agreements made by the oil and steel industries, and both will expire next February 28.

The recommendation that both laws be continued is said to have been made to the President by Secretary of Commerce Charles Sawyer, with stand-by allocation power in case the voluntary program breaks down, as it threatened to do before the election.

The export control act has been a potent weapon, used by the administration for several purposes. It has been used to carry out the original idea of directing exports to where they could do the most good, to insure that domestic interests would receive supplies adequate for their necessary operations, and to prevent foreign buyers from bidding up the price of American goods and thereby adding to inflationary trends.

The controls also have been used in the cold war against Russia, and have been so exercised as to cut off shipments of petroleum equipment to countries under Red domination as well as to ban exports to Russia of industrial equipment or other supplies which might add to its war potential.

The allocation powers which the President is expected to seek would be held as a club over industries, particularly steel, which fail to make or carry out voluntary allocation agreements considered necessary.

Sawyer's recommendations were submitted in response to a request by the President to the heads of all departments to make suggestions for legislation to be discussed in his State of the Union message.

McCarthy Plant to Make Chemicals Of Waste Gas Is Formally Opened

WINNIE, Tex.—Formal opening ceremonies were held here November 30 for the newly completed McCarthy Chemical Co. plant which will produce formaldehyde, acetaldehyde, and methanol from residue gas.

The significance of the plant from a gas-conservation angle was emphasized by the two principal speakers of the day: U. S. Congressman J. M. Combs, Beaumont, and Gen. E. O. Thompson, chairman of the Texas Railroad Commission. Combs said, "This plant is an outstanding example of the full utilization of one of the great natural resources of our area—natural gas. Not many years ago gas was burned in the field as a safety measure. Its sale would not defray the cost of gathering and transporting it to the place where a market for it existed. But because men of vision combined capital with the ingenuity and skill of chemists and engineers, a new industry has been created which will not only stop the waste of a great natural resource, but will put what formerly was waste to the use of our people."

Absorption Plant Residue Used

The new chemical plant is adjacent to McCarthy's absorption plant, and will process residue from that source. One hundred million cubic feet of natural gas daily will be processed to produce formaldehyde, principally, with smaller quantities of acetaldehyde and methanol. After the gas is processed, it will be sold as fuel to industrial, commercial, and domestic users in the area. Hence, 100 per cent utilization of the gas is accomplished.

Thompson emphasized the important role of natural gas in our economy in his address, "Past, Present, and Future of the Natural-Gas Industry in Texas." Glenn McCarthy, who owns 16 corporations in addition to the chemical company, officially opened the plant before the 600 guests present. Master of ceremonies for the afternoon was Kern Tips of the Houston advertising firm, Franke, Wilkinson, Schiwetz & Tips, Inc.

Visitors for the opening were conducted on guided tours through the latest addition to the McCarthy empire. Following the ceremonies, they were served "a real Texas barbecue" on the grounds.

Conversion of the residue gas, which is the basic raw material of the new plant, is accomplished by a direct oxidation process. This process transforms portions of the gas to aldehydes and alcohols. Oxygen used in this process is made at the plant in one of the largest installations of its type in the world. The oxygen is produced from air in a tonnage-scale plant using a modified Linde-Frankl cycle, low-temperature plant.

Officers of the McCarthy Chemical Co. are: Glenn McCarthy, president; G. M. McGranahan, vice president and general manager; A. G. McNeese, Jr., vice president and secretary; and Ralph M. Friesner, treasurer. Plant officials are: Hugh A. Neal, plant manager; Leon Dorsey, production superintendent; and R. C. Ledford, construction and maintenance superintendent.

Seven Firms Employed

Development work for the plant, including pilot-plant investigation and process design, was done by Fomac Engineers under the supervision of J. E. Bludworth. Mechanical engineering was done by Wyatt C. Hedrick, Inc., of Houston. Oxygen plant process design was by Hydrocarbon Research, Inc., and mechanical design and construction by Stacey-Dresser Engineering. Erection of the plant proper was performed by Tellepsen Construction Co., T & R Construction Co., and F. G. Hinote Co.

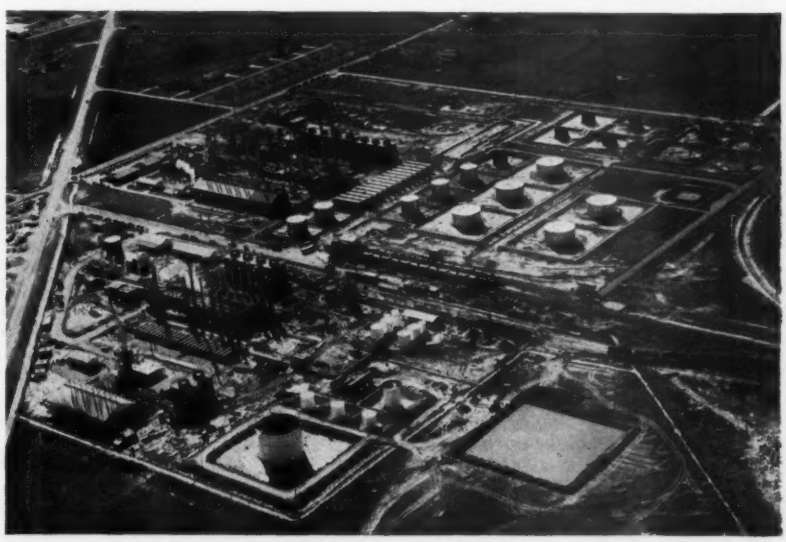
Gas Conservation to Be Considered by I.O.C.C.

CONSERVATION of natural gas will be the theme of the winter quarterly meeting of the Interstate Oil Compact Commission at Wichita, Kans., December 9-11. The annual election of officers will also be held at this meeting.

Gov. Frank Carlson of Kansas will open the meeting with an address on "What Conservation and Ratable Taking of Gas Mean to My State." Rep. Ross Rizley of Oklahoma, who was author of a bill to amend the federal Natural Gas Act, will speak on legislative trends affecting the conservation of natural gas. Recent gas developments in Canada will be discussed by N. E. Tanner, minister of lands and mines of the Province of Alberta. In addition, several of the committees are expected to take up problems concerned with natural gas, and the subject may be included in the open forum discussions.

In his annual report as chairman of the commission, Gov. Beauford H. Jester of Texas intends to discuss the tidelands situation and prospects for congressional action assuring state regulation of offshore oil development.

Several committees are expected to have reports ready for submission to the commission at this meeting. A draft of a national oil policy is being prepared by a subcommittee headed by Ernest O. Thompson of the Texas Railroad Commission and will be reported to the legal committee.



In the foreground, is the new multimillion-dollar chemical plant of McCarthy Chemical Co. at Winnie, Tex., which was formally opened Tuesday of this week. The plant will manufacture chemicals from the residue of the 100,000,000-cu. ft. per day absorption plant immediately behind it in the picture. The dual plant setup provides an excellent example of the effort being made by the oil industry for 100 per cent gas utilization. Such gas as still remains after processing through the gasoline and chemical plants is sold as dry gas for fuel

International

WORLD-WIDE OIL DEVELOPMENTS

Cloud on Concession's Validity Not Halting Danish Exploration

by Dahl M. Duff

DESPITE a recent statement issued by the Danish Government which questions inferentially the validity of its concession, Danish American Prospecting Co. itself said it has no reason to doubt the concession's validity and is continuing its exploratory operations in the normal manner.

On October 27, the Danish minister of public works, Karl Petersen, in a press release indicated that the 1938 salt discovery made by F. F. Ravlin, Coral Gables, Fla., which forms the basis for the 50-year concession of Danish American Prospecting Co., may have been fraudulent.

The minister stated the government had no desire of terminating its cooperation with Danish American Prospecting Co., whose work he said was "efficient and conducted in good faith."

He also said he saw nothing to prevent an arrangement satisfactory to both parties being arrived at after friendly discussion.

Authorized in 1932

The history of the concession goes back to 1932 when the Danish Parliament enacted a mining law which authorized the government to nationalize the subsoil and to negotiate a concession for exploration and development of all subsurface substances not then being developed.

In 1935 Ravlin began drilling in Denmark under a prospecting permit but after discovering a layer of rock salt in Harte 2 in November 1936, which discovery was certified by the Danish chief geologist, he filed for a concession on the Kingdom of Denmark, exclusive of Greenland and the Faroe Islands, an area of about 17,000 sq. miles. Negotiations were concluded in 1938 with the issuing of an exclusive concession to Ravlin's company, Danish American Prospecting Co., now generally known as Dapco.

The mining law, though scheduled to expire in 1940, has been extended through amendments, the latest in November of this year prolonging it 6 months to May 1949. Recent press statements have confused this law extension with the concession itself which runs to July 1988.

In July 1938, Gulf Refining Co. purchased Dapco from the Ravlin interests. This transaction was with the approval of the Danish Government. Two years later, the concession was amended in several respects by mutual agreement at which time the government again confirmed its validity.

Suspended During War

Dapco's operations were suspended in 1940 as a result of the German invasion of Denmark, but were resumed in 1946 with the approval of the Danish Government.

The attack of the validity of the salt discovery resulted from a technical committee appointed in early 1936 by the public-works minister with instructions to revise the mining law. The committee soon found that the exclusive concession extending to 1988 prevented any new concessions and that no purpose would be served in revising the law unless the concession would be radically amended.

The committee was then authorized to conduct an investigation of rumors that Ravlin had "salted" a core barrel with a piece of salt to obtain the concession. The committee's conclusions were also published October 27 with the claim that the evidence collected constituted "such strong circumstantial evidence that no doubt exists on the part of the members of the committee that the salt discovery was a fraud."

Informed of the minister's release and the committee's conclusion, Ravlin said: "I wish to deny emphatically that any such fraud was committed and to emphasize that the discovery of salt in Harte No. 2 was valid." He said the government had representatives on the well and if they had any doubts as to the validity of the discovery, they surely would have raised the question at that time.

Referring to the investigation and remarks by the committee, initiated many years after the discovery, Ravlin said that the decision was biased, one-sided, and of no legal value whatsoever, evidence for which exists, he said, in the fact that he had not been permitted to see the committee's evidence nor to examine its witnesses.

Dapco, which has spent some $5,000,000 already on exploration in Denmark, is now drilling its second deep test near Randers in north Jutland. Present depth is about 8,200 ft. The initial deep test last year in west central Jutland was abandoned at 7,985 ft. in the Lower Mesozoic. No shows of oil have been encountered, though some slight quantities of gas have been indicated.

Tremendous quantities of salt have been indicated in about 35 domes as a result of the company's operations, and other favorable structural conditions found. Total hole drilled thus far in the country amounts to slightly more than 60,000 ft. Several holes of 5,000-ft. depth have been drilled, and there have been a number in the 2,000-3,500-ft. range.

Albert Gregerson, vice president of Dapco, said recently that it may be another 5 years before the whole of Denmark is completely explored. The work now being conducted is considered the most complete survey made of any country in northern Europe.

Crude Output by Y. P. F. Running Above Last Year

Production by Argentine State Oilfields (Y.P.F.) during the first 7 months of 1948 amounted to 1,541,087 cu. m. or approximately 9,690,000 bbl.

This total of crude-oil production represented an increase of 178,077 cu. m. or approximately 1,120,000 bbl. over the corresponding period of 1947. Y.P.F. produces some 70 per cent of the country's total crude output which in 1947 averaged 59,800 bbl. daily.

Venezuelan Government Overthrow Has Little Effect on Oil Fields

International
WORLD-WIDE OIL DEVELOPMENTS

AN Army group overthrew the Venezuelan Government last week but oil operations in the world's second largest producing country continued without serious interruption.

Reports in New York were that oil-company and other offices in Caracas had reopened and that the production and movement of oil throughout the country were normal, despite a brief protest strike in the Lake Maracaibo area.

The military seizure of power was accomplished without b l o o d s h e d. Some shots were fired in Caracas and the situation there was tense earlier in the week, but the remainder of the country was reported calm. Police and guardsmen sided with the military, making any effective opposition by labor supporters of the existing government almost useless.

Lieut. Col. Carlos Delgado Chalbaud took over as president of an interim governing military junta, and issued a statement saying, "We want to state categorically that this movement is in no way intended to install a military dictatorship."

Engineer in Cabinet

The new cabinet includes a number of military men and conservative members of the government which was in power prior to October 18, 1945. The new Minister of Fomento (Development) is Dr. Pedro Ignacio Aguerrevere, an engineer and geologist who is very familiar with the oil industry. He is a graduate of Stanford University and for many years was commercial counselor in the Venezuelan Embassy in Washington.

The political unrest, which had been felt in Venezuela for some time, came to a climax November 24 when the government was taken over by a military group headed by Major Marcos Perez Jimenez, who was later named Minister of Defense in the new cabinet.

Earlier this group had requested President Romulo Gallegos to reorganize his cabinet to include others than his own political party, Accion Democratica. When negotiations broke down Gallegos resigned and the military group disbanded the government, took charge of all public buildings, and is understood to have placed top government officials under house arrest.

The action was explained by Major Jiminez in a radio broadcast in which he said:

"The armed forces supported A.D. (Accion Democratica) in 1945 because we believed it was a sincere movement acting in behalf of the people. A.D. has continued all the vices of the old regime, monopolizing everything for its own party. A.D. recently attempted to sow dissention in the armed forces in order to dominate them. The president was advised but he was powerless to act. The armed forces requested that the situation be corrected by a cabinet change.

"At the very moment in which the change was being discussed, an A.D. union federation declared a general strike. The armed forces were advised of this general strike by a high-ranking A.D. official. In view of this irresponsible action the army took over the government. The armed forces promise the people they will continue to look after their interests and betterment. A new government is being formed and will shortly be announced. This government will be adequate and appropriate to the needs of the country, eliminating extremist elements."

Early this week, there was no official comment from executives of United States oil companies with operations in Venezuela. Investment of American companies in Venezuela is estimated at about $2,000,000,000, and the country's production of about 1,350,000 bbl. of crude daily is a major factor in the present narrow balance of supply and demand. Approximately 8,000 United States citizens are estimated to be working in Venezuela, most of them for oil companies.

Colonel Chalbaud, new head of the government, declared V e n e z u e l a would continue "to maintain cordial relations with the United States as always" and that "all foreign investments in Venezuela would be duly safeguarded and protected." He said "incapacity" of the government led to the crisis and that the military group would step out of the government after new elections are held.

Studying the significance of the army coup, oil-company representatives in New York believed that the new government would be somewhat more to the right than its predecessor. With the danger of open fighting averted, they saw no reason to consider the new regime as inimical to the oil industry, on which the prosperity of the country is largely dependent.

Venezuelan Refinery Will Increase Crude Capacity

Texas Petroleum Co., S.A., Petrolera Las Mercedes, and Venezuela Gulf Refining Co. have signed a contract with the government of Venezuela, through which they commit themselves to increase by 5,000 bbl. per day the capacity of the refinery which is being built in Puerto La Cruz under an agreement signed early this year.

With this increase in capacity, Texas Petroleum and Petrolera Las Mercedes comply with their obligation to refine 10 per cent of the crude produced in their concessions within Venezuela. Minimum capacity of the refinery now under construction and to be completed by January 1, 1951, will be 25,000 bbl. daily but the operators are considering increasing the capacity to 30,000 bbl. daily, should production from the concessions held by the two companies increase to the extent that the 10 per cent which they are obligated to refine exceeds the capacity of the refinery as now planned.

In exchange for the obligation to refine 10 per cent of their production, the companies will be given special custom rates and they will be exempt from payment of customs duties and taxes resulting from the importation of materials for the refinery.

Egypt Gets 14½ Per Cent Royalty on Sinai Output

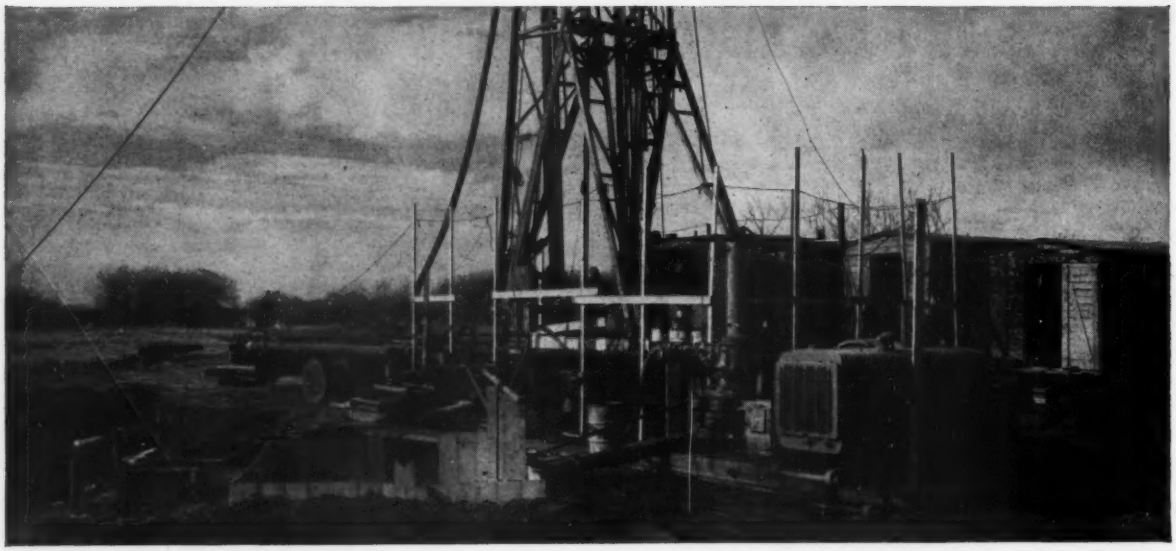
The Egyptian Government has been granted 14½ per cent royalty with the additional right to purchase another 10 per cent of the production from Sudr and Asl fields on Sinai Peninsula.

According to reports in New York, these provisions came with the approval of the leases on which the fields are situated. The additional 10 per cent of the production is to be bought at approximate market value.

Sudr field, now producing about 6,000 bbl. daily, was brought in as a joint operation of Anglo-Egyptian Oilfields, Ltd. (Shell controlled) and Socony-Vacuum Oil Co., Inc., which had pooled their Sinai rights. The discovery was made late in 1946. Asl, 10 miles to the south, was discovered later and is now awaiting transportation facilities.

Reports are that the new Egyptian oil law with royalty varying up to 25 per cent has not been finally approved. Proposals have been made for companies to be 51 per cent owned by Egyptian nationals, and it is considered that such a provision would place a damper on further exploration.

At Suez the Egyptian Government operates a small-capacity refinery. A much larger 35,000-bbl. daily plant is operated at Suez by Anglo-Egyptian.



Typical of wildcat operations in the central plains region of Alberta Province, Canada, is this test being drilled by Northern Development Co. for East Leduc Oils, Ltd., in the Saunders Lake area, 10 miles southeast of Leduc field

Operators in Canada Face Variety of Import and Exchange Regulations

by Neil Williams

IN a previous article some of the governmental regulations and policies affecting acquisition of oil and gas rights and exploration and development in western Canada were discussed. Equally important and of interest are some of the operating procedures as they relate to the drastic restrictions against expenditures and transfer of money outside the country and ability of the petroleum industry to obtain equipment and personnel to carry on exploration and development programs.

Current restrictions against expenditures and transfer of money outside the country come under the Dominion's Austerity Act which was placed in effect in October 1947 to curb the depletion of the country's short supply of American dollars and which was occasioned by the existing unfavorable trade balance with the United States. Under the restrictions, imports have been limited to those goods which cannot readily be obtained or produced in Canada, and except for certain necessary items restrictions in the form of high tariffs and quotas have been imposed on these.

It so happens, however, that, except for a few items, equipment needed in the exploration, drilling, and production of oil and gas is not available from Canadian sources and necessarily must be obtained from manufacturers and suppliers outside the country. Under these circumstances such equipment is exempt from the import embargo, and can be purchased wherever obtainable and brought into the country, subject only to monetary exchange regulations and certain other conditions, principally the establishment of proof of need and obtaining the necessary permits for customs clearance.

International

This article, one of a series of on-the-spot reports by a Journal staff writer, explains some of the practical problems of customs, immigration, and financial regulations which must be met by American oil operators engaging in exploratory work in Canada.

Furthermore, entry of certain equipment considered essential for exploration and development of the country's petroleum resources is permitted without duty or sales tax. This is provided for under Tariff Item 848 which lists as duty-free "all machinery and apparatus and parts thereof (including motive power and rope) and drilling mud for use exclusively in exploratory, or discovery work in connection with, and development, depletion and production of petroleum or natural gas wells; seamless, lap-welded and electric welded iron or steel casing, tubing and drill pipe for use in connection with natural gas or oil wells."

Although a literal interpretation of the above designation of equipment exempt from duty or sales tax might embrace any item used in the exploration, drilling for, and the production of oil and gas, in actual practice the exemptions from duty apply mainly to nonconsumable goods and only to the main equipment that is actually required and which is not available in Canada. Drilling line, for instance, is classed as a consumable item, and as such would be subject to duty and sales tax. However, in the case of bringing in a complete rig by a contractor or oil company, one line might be included as essential equipment on that rig. An extra line, or any later replacement of this line, would be subject to import regulations and also duty and sales tax. In the case of wire line there is a further complication in that this product is manufactured in Canada and can be imported only if the operator

can prove that the Canadian product does not meet his particular requirements or is not of comparable quality with the product to be imported.

Extra pumps and engines, or other additional equipment, auxiliaries, and accessories over and above the equipment essential for operation of a drilling rig also might be classed as liable to duty and sales tax when brought in as parts of a particular rig. Among extra accessories are such items as canvas enclosures for rigs. Although advantageous and essential for the comfort of drilling crews and protection of equipment in winter operation, enclosures are not rated as necessary to drilling. Consequently, canvas cannot be entered duty-free. Canvas, being a cotton product, also is on the import embargo list, and can be entered only as equipment used in exploration and drilling for oil or gas, and then only on a quota basis, which involves considerable governmental "red tape." Its entry, like that of wire line, is further complicated by the fact that canvas is manufactured in Canada. Only by showing that the product to be imported has some distinctive feature or quality that makes its use more suitable than the Canadian canvas, can it be entered at all.

Cement Imports Barred

Cement, although one of the essentials in drilling and completion of wells, is not importable. It is readily available from Canadian manufacturers in nearly all grades and qualities needed by the petroleum industry, and as such must be purchased within the country.

It will be noted that exemptions from duty or sales tax do not apply to equipment used in the transportation of oil or gas or in refining or natural-gasoline plant operations.

There are two forms of entry, namely: permanent and temporary. These are applicable either to equipment and facilities or to personnel. Equipment entered on a permanent basis is subject to such import and monetary exchange regulations and restrictions, duties, and sales taxes as may apply to the particular equipment. That entered on a temporary basis is not subject to any duties or sales taxes but cannot be sold or otherwise disposed in the country. Any facilities needed or used by an oil company, service or geophysical exploration company, or drilling contractor may be entered on this basis but cannot be kept in the country longer than specified periods.

Temporary entry permits are issued for 6-month periods but may be extended for successive periods. This arrangement permits those companies which may not wish to operate permanently in Canada to take their equipment in and out of the country when they desire. In this connection, however, it should be stated that any investments made in Canada or any profits realized in these operations must be retained in the country.

Somewhat more stringent restrictions govern the entry of motive equipment, such as automobiles, trucks and trailers, tractors, etc., which are on the import embargo list. New motive equipment cannot be purchased outside the country, so that any such equipment which companies may bring in is limited to that which they already own, and which necessarily must be used equipment. Companies entering on a permanent basis may bring in at that time such motive equipment that is necessary to meet their immediate needs. This is subject to a relatively high duty and tax. Although there is no limitation on what motive equipment can be brought in on a temporary permit, a monthly tax amounting to 1/120 of the appraised value (10 per cent per year) is imposed as long as the equipment is in the country. Like any other equipment brought in on a temporary basis, it cannot be sold or disposed of in the country, and must be taken out at the end of the permit period.

Import Procedure Explained

Importing of equipment purchased from American manufacturers and suppliers involves considerable red tape. When an order is placed the manufacturer or supplier provides the purchaser with an invoice in triplicate together with five copies of a Canadian "M.A." invoice, the latter being in effect an application to Canadian customs for import of the items listed. The purchaser then, either directly or through a customs broker, presents these to his bank. The bank, in turn, then issues to the Canadian Government an application on Form "E" for foreign exchange. In most instances the government will have a foreign-exchange representative in the bank to handle the matter, and thus eliminate the necessity of dealing through the capital at Ottawa.

International
WORLD-WIDE OIL DEVELOPMENTS

If the customs department gives clearance for the import and the application for foreign exchange is approved, the government issues to the bank an authorization on Form B-1.

In the meantime, the shipper provides the bank with a copy of the bill of lading and an American export authorization on American Form 7525-V. These, together with copies of the Canadian approval forms and invoices, are then supplied the purchaser, or the customs broker as the case may be, who, in turn, sends them to the desired port of entry to await the arrival of the shipment or to the shipper for presentation to customs officers upon the arrival of the shipment. Payment is made by the purchaser's bank through New York banks on the basis of current foreign-exchange rates which now discount Canadian money about 1 per cent.

Temporary Entry Limited

Americans entering Canada to live and do business in the country also may do so either on a permanent "landing" basis or on a temporary permit. In the former case they may enter all their household and personal effects, including one automobile, without duty or sales tax. These also may be taken out at any time without restrictions. As permanent residents they are subject to the same regulations and restrictions as Canadian citizens in respect to transferring money from the country, payment of taxes, etc. One of these restrictions is that no individual may spend more than $150 per year outside the country except for strictly business purposes, and then with strict limitations. Also any money earned and paid in the country must remain there.

Entering on a temporary landing permit, one may take into the coun-

Separator and tank battery installation for Imperial Oil, Ltd., 1 Redwater, discovery well of western Canada's newest field, located 35 miles northeast of Edmonton. In the picture are Jack McCaskill (left), petroleum engineer, and Norman Wright, production foreman

try only what is necessary for him to use during the period of the permit. Such a permit is issued for a period of 6 months, but is renewable in successive 6-month periods at the discretion of immigration authorities if desired. On a temporary permit, one is not limited in expenditures outside the country to any specific amount except that he is not permitted to take out any more than he brought in at the time of his entry. A temporary resident also is not liable for Canadian income taxes unless he remains in Canada longer than 6 months.

Entry of noncitizens for employment in Canada, except those seeking permanent residence, usually is restricted, however, to those to be engaged in supervisory or technical capacities or work requiring particular qualifications and adaptation and for which Canadian citizens or permanent residents might not be available. In any capacity, most American companies operating in Canada have followed the policy of employing Canadians so far as possible.

The tight control exercised over movement of money out of the country is indicated by the experience of one American citizen who had entered the country on a permanent landing permit. Receiving checks covering royalty payments on oil produced in the United States, he wished to return the checks for deposit in an American bank. Although the checks were on American banks covering payment for royalty on American-produced oil, he was required to deposit or cash them with a Canadian bank and retain the money in the country.

In some cases, however, it has been possible for companies or individuals having American funds in American banks to arrange payment for services through those banks with the payee retaining the money in the United States except for what is sent to Canada through foreign exchange to cover necessary operating expenses. American drilling contractors, geophysical exploration and service companies, as well as individuals, working in Canada on a temporary basis, in some instances receive payment for their services by this procedure.

Iraqi Government and I.P.C. Begin Negotiations on Concession Revision

NEGOTIATIONS have been commenced in Bagdad between Iraq Government officials and representatives of Iraq Petroleum Co., Ltd., over the government's proposal for increased royalty payments and revision of some other concession clauses.

H. H. Witley, assistant managing director, has arrived in Bagdad from London, the company headquarters, to represent I.P.C. and its two associated Iraq companies, Basrah Petroleum Co., Ltd., and Mosul Petroleum Co., Ltd.

A recent Iraq note handed to representatives of the three companies in Bagdad outlined the aims of the government in its desire to review parts of the three concessions. The government is asking:

1. Payment of royalties in gold and in accordance with the free-market prices of gold. The company is now paying royalty at 4 gold shillings a ton with payment in sterling equivalent to about 21½ cents a barrel.

More royalty for the oil now being produced in Iraq and to be produced in the future is admittedly the principal demand of the government on the companies. The question of payment in gold involves the different values for this medium. I.P.C. now pays at the accepted British buying rate for gold.

2. Increased oil production. Reports are that government officials believe the companies can double their production, though at present, output has been reduced to some 43,000 bbl. daily, half of normal, by the closing of the Kirkuk-Haifa pipe line.

3. Training of more Iraq nationals in company operations and replacement of various foreign personnel now working in Iraq.

4. Participation by Iraq nationals in stock of the company up to 20 per cent. In this connection, government officials pointed out articles in the concession contracts stating that whenever shares are offered to the general public, Iraqis in Iraq are to be given preference up to 20 per cent of the issue.

Mohammed Al-Naqib, acting director general of the Ministery of Economics, said the most important point in the discussions "is Article 10 of the Iraq Petroleum Co. concession dealing with an increase in royalties and future oil market prices."

"This article," he said, "must be reviewed in the light of the present world demand for oil and the forecast of shortage of oil in some oil centers of the world. We have been very frank with the three companies and hope that the talks will be carried on in friendly terms."

The Iraq company is owned equally by Anglo-Iranian Oil Co., Ltd., Shell interests, Cie Franciase des Petroles, and Near East Development Co. [Socony-Vacuum Oil Co., Inc., and Standard Oil Co. (N.J.)], with the exception of 5 per cent held by C. S. Gulbenkian. Late last month, the partners reached an agreement freeing themselves from the "Red Line" restrictions which specified only joint oil operations in much of the Middle East. A corollary agreement reported provides for stepped-up production by the Iraq company itself.

Production in Iraq, however, is limited by pipe-line facilities to the Mediterranean, and the Iraq Government is blocking use of the line to Haifa in Israeli territory. Resumption of flow in the line, which in turn means more normal royalty to the Iraq Government, apparently hinges on some settlement of the Arab-Jewish differences.

The acting director general of the Iraq Ministry of Economics said in this connection that "the Iraq Government has prevented the oil company from pumping through the Haifa pipe line since last May when 150 meters of the line situated between Transjordan and Palestine was cut and the Iraq army given full premission to guard the pipe line. Since then not a drop of oil has passed through this line."

Reds Say Oil Activity Ahead of 5-Year Plan

DEVELOPMENT of the Russian oil and natural-gas industries is being maintained at rates above those aimed at in the postwar 5-year plan, it was maintained last week in an official report released through the Soviet embassy in Washington.

The report, prepared by the central statistical administration of the Council of Ministers, disclosed that only 2 of 26 major industries failed to hit their target during the third quarter and that output of the most important industrial products ran from 3 to 341 per cent ahead of the corresponding period last year.

Since it is the Soviet custom to report all production activities in terms of percentages without revealing base figures, no calculation can be made of the actual output covered by the statistics.

The report showed, however, that third-quarter crude production was 109 per cent of that for the same period in 1947, while gasoline production was 107 per cent of last year, kerosine 118 per cent, and natural gas 103 per cent.

During the period, it was stated, the oil industry of the southern and western areas exceeded the quarterly production program by 6 per cent and the oil industry of the eastern areas topped its quota by 12 per cent.

Congress May Be Asked for Funds For Synthetic Fuels Industry

WASHINGTON. — The Interior Department may ask Congress for anywhere up to $800,000,000 next year to get a start on developing a synthetic-fuels industry on which as much as $12,000,000,000 may eventually be expended by the Government with a view of obviating any shortage of oil in the event of war.

The department last session suggested a $350,000,000 appropriation as the first step toward an industry which it was estimated would cost in the neighborhood of $9,000,000,000. That estimate has since been upped by one-third, in part apparently because of increases in anticipated costs which have occurred but in part also, reportedly, because of a desire to establish plants in Alaska as well as the continental United States.

The Bureau of Mines is now engaged in a $60,000,000 program to demonstrate the feasibility of commercial production of synthetic fuels from natural gas, oil shale, and coal, and Secretary J. A. Krug asked Congress last February to authorize the construction of three commercial-size plants, one for oil shale and the others for coal, and suggested a program for the development of a privately owned and operated synthetic fuel industry with loans and technical assistance from the Government.

Steel Shortage an Obstacle

The department's proposal anticipated an eventual production of 2,000,000 bbl. of oil daily, but it was admitted that the steel and other supply situations then prevailing would not permit more than a start toward that objective, which it was figured would require about 16,000,000 tons of steel.

Legislation to carry the plan into effect was introduced by Rep. Charles A. Wolverton of New Jersey, chairman of the House interstate commerce committee, after lengthy hearings. That bill provided 30-year loans for construction of plants by private industry and for government purchase of products at prices which would assure a fair and reasonable return to producers of synthetic fuels.

The bill also carried a provision that if private industry failed to take advantage of the opportunity, plants would be constructed by the Government.

Oil industry representatives who testified on the subject before congressional committees took the position that industry itself would develop synthetic fuels when economic conditions indicated the time for their introduction was approaching, and pointed out that a number of organizations already were interested in the subject and were conducting extensive experimental work.

Interior officials, however, do not believe that the development of this means of providing for wartime needs should be left in such an indefinite state, pointing out that should we become involved in war the building of synthetic fuel plants would require more time, materials, and manpower than could then be spared.

Although the spread in cost between synthetic and natural oil has been narrowed as a result of development already attained, they feel there is still need for the Government to establish the industry because synthetics cannot be produced cheaply enough to compete with petroleum.

Trade Agreements Act May Be Made Permanent

WASHINGTON. — Legislation making the Reciprocal Trade Agreement Act permanent, eliminating the political pressures inherent in the present necessity of bringing it up for extension at frequent intervals, will be introduced in Congress at the opening of the session, it was announced last week by Rep. John D. Dingell of Michigan, a prominent Democratic member of the House ways and means committee.

The measure is due to come before Congress next year, under legislation enacted at the last session extending it only until June 30, next, and changing the procedure for the development of reciprocal trade agreements.

Dingell said his bill would repeal the hobbling amendments incorporated in the law this year, including the requirement that the Tariff Commission determine points below which import duties could not be reduced without imperiling domestic production.

Congress would continue its "investigatory supervision" over the trade agreements, Dingell said. However, in extending the act last session, the Senate eliminated a House provision for congressional veto of undesirable concessions and left little scope for congressional action, although another provision requires the President to report to Congress any agreement in which he ignores the Tariff Commission's recommendations that duties not be lowered below a certain point.

FTC Asked to Compromise On Basing-Point Pricing

WASHINGTON.—An invitation to arbitrate the basing-point issue was extended to the Federal Trade Commission last week by the Senate trade policies subcommittee.

In a letter to FTC Chairman Robert E. Freer, Sen. Homer E. Capehart of Indiana, chairman of the committee, suggested the two groups might sit down together and "try to work out an appropriate solution of the confusion now existing with respect to pricing policies."

In making his letter public, Capehart said the committee has been anxious to find some witnesses from business or industry who will testify in favor of f.o.b.-mill pricing, which FTC officials have indicated is the only system they will consider legal, but, he said, "with one or two exceptions, the only witnesses the committee has found who favor f.o.b.-mill pricing are theoretical witnesses such as economists and Trade Commission experts."

While he is hopeful that the commission will give favorable consideration to his suggestion that the issue be arbitrated, Capehart is going ahead with his hearings, and late this week will take its first testimony from oil-industry representatives when Roland V. Rodman, president of Anderson-Prichard Oil Corp., Oklahoma City, and Harry E. Milton, Milton Oil Co., St. Louis, testify. The two company executives are expected to discuss the Supreme Court decision in the Cement Institute case from the standpoint of the refinery industry.

Rank Wildcat in San Juan Basin Flows Condensate

Flowing an estimated 200 to 500 bbl. per day of straw-colored condensate along with 20,000,000 cu. ft. of gas, Byrd-Frost, Inc., and Western Natural Gas Co. 1 Driscoll, CNL NE NW 3-38n-19w, on the Dove Creek structure, Montezuma County, in extreme southwestern Colorado, near the Utah line, looks like an important strike in a remote, rank wildcat area.

Production is from a zone in the Paradox (Pennsylvanian) through 96 perforations in pipe at 5,910-34 ft. On first test, the well flowed naturally an estimated 2,000,000 cu. ft. The well was then acidized with 7,500 gal., cleaned itself, and flowed a wet gas, with 650 psi. flowing pressure after 5 hours. On November 27, the well was again opened and began flowing as described above. This strike is considered of major importance to the general play in the San Juan and Colorado River salt basins in the four-state corner area.

Attorneys General Fight for State Ownership of Tidelands

by Leigh S. McCaslin, Jr.

HOUSTON.—Despite expressed pessimism in some quarters since the presidential election, the leading exponents of state ownership of the tidelands—the National Association of Attorneys General—are full of fight and hope.

This attitude was very evident this week in Houston, where the group held its annual meeting. The association, since 1939, has actively led the fight for state ownership of submerged lands beneath navigable waters (the term "tidelands" is a misnomer). Its tidelands committee wrote and sponsored both of the bills on the subject which thus far have been before Congress.

Despite lack of success at the Eightieth Congress, the committee outlined in Houston its plans for a renewed fight at the coming session. The committee report, which was presented by Walter J. Johnson, Nebraska Attorney General, outlined the strategy to be used in the Eighty-first Congress as follows: "It is unfortunate that we cannot continue from where we left off at the end of the past session, but the unfinished business dies at the end of the session and when the new Congress comes into being it will be necessary for us to start all over again. There will have to be new bills introduced, hearings, and the like.

"However, we expect that the new Congress will utilize the printed record of the hearing, which is embodied in two volumes containing 2,038 pages. The printing of this record was a factor that delayed the progress of the bill in the Senate. The hearings before the committees in the coming session should not take up much time and it may only require a few days."

The committee expressed the opinion that "it would be impossible for federal agencies to procure passage of any federal control bill in the coming Congress as a good majority of both the House and the Senate will be favorable to the states."

In further discussion, the committee refuted in strong words the accusations of some that we are the tools of and being financed by the oil interests. It stated: "Nothing could be further from the truth—our program has been carried on by the states."

Price Daniel, Attorney General of Texas, in an interview with a Journal staff member, discounted the effect of Truman's election victory on the submerged-land struggle. He emphasized that "a Democratic congress in 1945 passed the original bill recognizing state ownership. Further, the President made no issue of the tidelands in his campaign, and federal ownership of the submerged lands was not a plank in the Democratic platform. Harold Ickes, the original proponent of federal ownership, did try to get such a plank in the Democratic party platform. However, this proposal was overwhelmingly defeated by the full platform and resolutions committee of the national convention in Philadelphia."

In further support of his optimism, Daniel revealed the results of a conference he and Sen. Tom Connally had with President Truman in February of this year. "President Truman promised us that he would not make up his mind on this issue until legislative action had been taken by Congress. He further promised that he would give the states ample opportunity to present their case before him in full."

In answer to a question, Daniel predicted that the change in state administrations as a result of the recent election would have no bearing on the situation.

Gov. Beuford H. Jester of Texas, in welcoming the group to the state, made the submerged-lands issue the dominant subject in his address. In part, he said "I remind you it was a Democratic Congress which passed that bill, and my Republican friends here today need have no fear but that the Democratic Congress in 1949 will be right again and pass this bill again when they have the true facts from our organizations. I am keeping in close touch with Congressman Sam Rayburn of Texas, who will be Speaker of the House in the Eighty-first Congress. I talked with him on this subject only last night over long distance."

In closing his tidelands discussion, Jester stated, "as a result of our cooperation, a majority of the new Congress is with us and I assert that there is a good chance that the states will win this fight and that the Congress will pass this legislation before the end of next year. It is the duty of the attorneys general, the governors and all state officials to see to it that President Truman has the true facts before him when and as this legislation is passed."

Texas L. P. G. Men See No Shortage; Storage Will Be Principal Problem

HOUSTON.—No shortage of liquefied petroleum gases is expected this winter by Texas producers and dealers.

This opinion was expressed last week at a meeting of Gov. Beuford Jester's emergency fuel commission. The 100 producers and dealers present agreed that the only problem was one of storage. Former State Sen. Clint Small of Austin, speaking for the producers, said all concerned should increase their storage facilities. He emphasized that consumers must be educated to their responsibility of providing themselves with storage facilities.

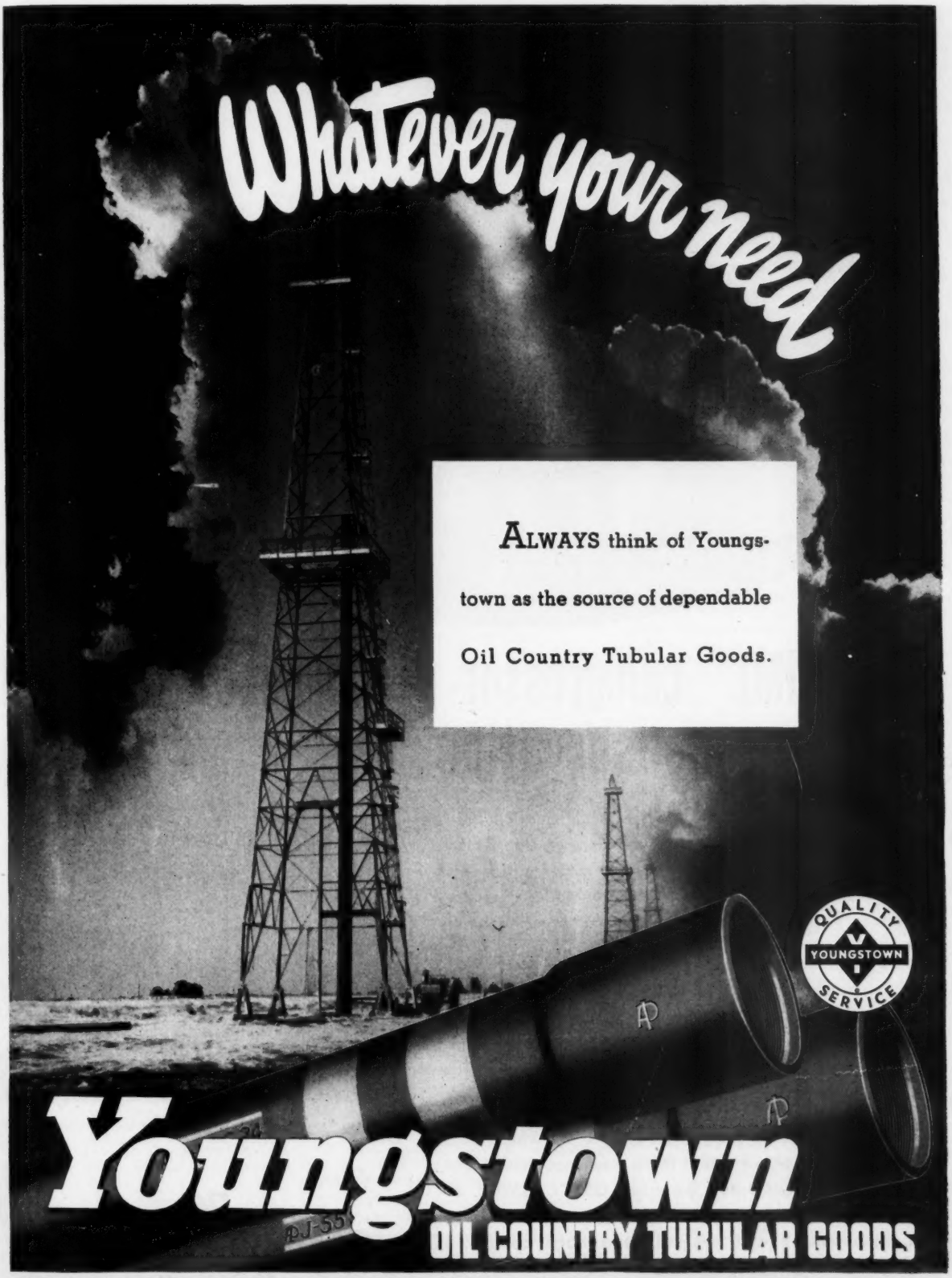
Average daily domestic and commercial demand for liquefied petroleum gases in Texas is about 1,000,000 gal. and production is 1,500,000 gal. However, the peak demand in winter exceeds the daily production and the difference must be met by storage.

A 6 per cent increase in consumer storage and a 12 per cent increase in dealer storage over last year was disclosed by emergency fuel commission figures. However, this was at least partially offset by a 10 per cent increase in new consumers.

In addressing the group, Governor Jester thanked them for their cooperation and stated: "I'm hoping that we never have to call the emergency commission together a g a i n." The group was set up last year to attempt to alleviate a winter-time butane shortage. Producers' and dealers' advisory committees were set up this week to work with the fuel commission.

Members of the producers' advisory committee are: Kenny White, Houston, Warren Petroleum Co.; Leo Wilmoth, Amarillo, Shamrock Oil Corp.; W. H. Justice, Corpus Christi, La Gloria Corp.; Paul Bagley, Lone Star Gas Co.; and C. R. Daugherty Bartlesville, Okla., Phillips Petroleum Co.

Dealers' advisory committee include: Brian White, Port Arthur; Albert Pickens, Tyler; W. E. Fraley, Abilene; J. W. Gaddy, McCamey; Charles Lacy, Dallas; Arno Purtell, Lubbock; and Chapman Rice, Weslaco.



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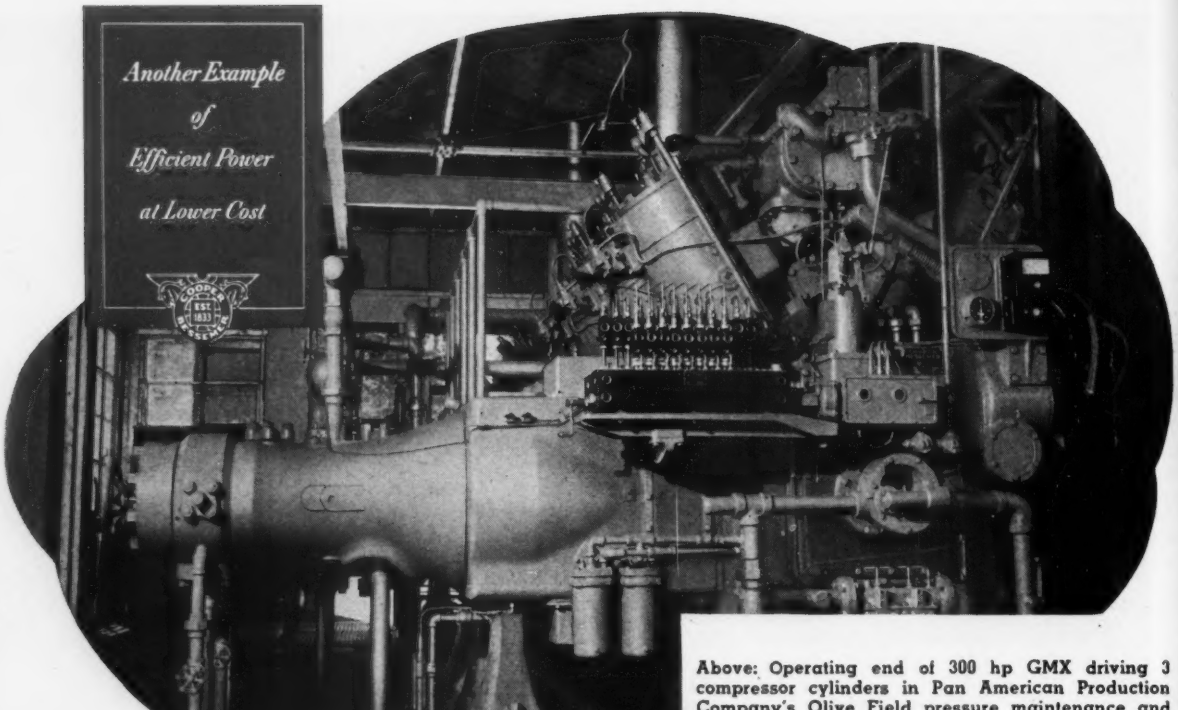


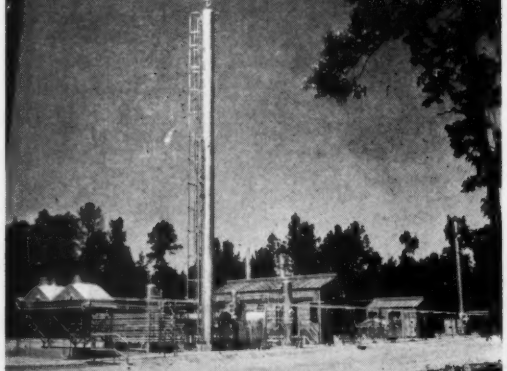
Above: Operating end of 300 hp GMX driving 3 compressor cylinders in Pan American Production Company's Olive Field pressure maintenance and crude stabilizing plant.

"BIG-TIME" compressor performance for small field gas conservation

OLIVE FIELD, TEXAS, rates as one of the smallest fields to utilize pressure maintenance. Here, in Pan American Production Company's pressure maintenance and crude stabilizing plant, two of the smallest Cooper-Bessemer V-angles, Gmx's, meet the compressing needs ideally.

The two units, 200 and 300 bhp, have a combined capacity of 4,166,000 cu. ft. a day. The gas, formerly wasted, is compressed through 3 stages from 250 psi to 4,800 psi injection pressure, all residue gas being returned to the producing formation through a single injection well.

If your plans call for compressor service anywhere from 200 to 2,400 bhp per unit, there are modern, highly efficient Cooper-Bessemer V-angles, GMX's, GMV's, or GMW's, that offer you big savings in the cost of installation, maintenance and over-all, long-range operation.



General view of plant. All gas, formerly wasted, is now returned to producing reservoir or used as plant fuel.

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WASHINGTON WATCHING

BY BERTRAM F. LINZ

Oil Versus Atoms

WASHINGTON. — The question whether the mass spectrometer can be readily converted for use in connection with atomic energy continues to be hotly debated in government circles while companies which would like to install the instrument in their refineries abroad sit on the sidelines awaiting a decision as to whether it can be exported.

Strongest opponent of export is the Atomic Energy Commission, which itself uses the instrument but, of course, in such modified form that it would be useless for oil-refinery operation. The AEC is supported by the military, although there is some doubt whether high Army and Navy officials have sufficient technical knowledge of the instrument to give a well-reasoned opinion as to its convertibility.

On the other hand, the industry, with some support from other agencies, argues that it would be impossible to convert the mass spectrometer from oil to atomic energy in less than a year, and then only by discarding everything but the tube and possibly the base and incorporating new equipment which is not generally available and would have to be designed and built from scratch.

At the same time they point out that the instrument, which affords better control of refinery operations and quick analysis of products, is essential to European refineries if they are to meet the objectives of the European recovery program for expansion of the continental industry.

Currently, the mass spectrometer is a United States monopoly, but it is reliably reported that English and European engineers are working on it, and it is feared that if the ban on exportation from this country is maintained it will be only a short time before a competitive product is made available abroad.

Cooking With Cat-Cracked

CATALYTIC cracking gives promise of becoming as important to the natural-gas industry as it is to the oil industry.

Already in commercial use by at least one gas company, the process is seen by engineers as an effective method of relieving the peak-load problem of local gas distributors and, in effect, about quadrupling the capacity of the delivering natural-gas pipe line.

These results are attained by cracking natural gas, followed by enrichment with propane or butane up to the same heating value as the feedstock gas. So far, however, catalytic cracking has been limited to propane or butane, with enrichment by hydrocarbon vapor, but any light hydrocarbon may be cracked, including natural gas, casing-head gasoline, and straight-run gasoline.

Relatively low production cost is claimed for the process, which also has advantages in that it results in no production of byproducts which are hard to dispose of and requires no gas holders. The gas can be fed directly into mains, making easy the additional local production required when peak demand exceeds pipe-line supply. No adjustments of consumer equipment are necessary for its use.

Gas engineers see in the process a practical means of dealing with temporary natural-gas shortages but also believe that it may be installed to supply the base load in plants built to supply entirely new areas.

Better Buying Boosted

OIL companies which do business with the Government, particularly with the Bureau of Federal Supply, will be highly interested in recommendations that will be made to Congress next year by the Hoover commission, which will have as their objectives the elimination of problems which now beset government contractors and the saving of $250,000,000 a year by the Government itself.

Some of the deficiencies of the present system were pointed out recently by former President Herbert Hoover, chairman of the commission, and many of the criticisms resulting from the studies of a "task force" will be concurred in by industry.

The task force found that government civilian purchases run to nearly $1,000,000,000 a year, while the armed services spend an additional $5,000,000,000 for materials, supplies and equipment, the two making the second largest expense item in the federal budget; the Government has inventories valued at approximately $27,000,000,000 and operates at least 1,000,000 motor vehicles valued at approximately $2,000,000,000, and it takes nearly 150,000 federal employes to handle the supply operation.

Major complaints of the commission are: A maze of laws and regulations which makes unnecessary red tape and prevents economy; lack of expert knowledge by purchasing personnel; failure to develop advance schedules of buying; lack of attention to storage and poor utilization of surplus inventories; and poorly drawn specifications.

All of these criticisms have been voiced repeatedly in the past by industrialists who do business with the Government. Maybe something will be done about them one of these days.

Incubating Agencies

A BLUEPRINT for the quick establishment in the event of an emergency of streamlined equivalents of all the control organizations set up during the last war—Petroleum Administration for War, War Production Board, War Manpower Commission, Office of Price Control, Office of Defense Transportation, Foreign Economic Administration, and the like—already has been worked out by the National Security Board.

Further, it has been disclosed, there already exists within the Government the nucleus of each of these organizations, which would quickly be expanded should need arise.

Industry committees set up to work with the board in an advisory capacity are being "briefed" on the problems of industrial mobilization, and surveys are being made of plants and factories to determine the best purposes to which they could be put in the event of war.

The board also is making surveys of natural resources, such as petroleum, which not only cover our domestic position but are being extended to countries from which we could reasonably expect to draw supplies in case of emergency.

While board officials have stated definitely from the beginning that they were planning for complete control of industry and civilian activities in the next war, it has not generally been known that the "nucleus" of the control organizations has been developed and it was understood that the board's planning had been confined to paper. But NSRB officials explain that these nuclei are nothing more than experts in key positions throughout the Government who could switch to the control agencies, and disavow any effort to set up any groups outside the board which would be prepared to function as wartime agencies.

War Revelations

IT'S water long over the dam, but the Army Department this week released the last of 11 volumes relating to the German war crimes trial, the final volume being of interest

chiefly because of the documents which are included.

Also, incidentally, the book makes public for the first time selections from pretrial interrogations of leading Nazi prisoners, disclosing what they thought of Hitler, the whole probably being best summed up by von Papen who said "He was the greatest crook I ever knew."

Members of the oil industry, especially those who ran themselves ragged at home and around the world to produce and transport the tremendous volumes of oil which made victory possible, will be interested in documents submitted in defense of Albert Speer, Reich Minister for Armaments and War Production, giving a graphic description of the physical ruin and economic collapse which Allied bombing brought to Germany.

In June 1944, these documents show, Speer advised Hitler that the enemy had destroyed 90 per cent of Germany's supply of aviation gasoline. By the following March, coal production in the Ruhr had been blasted to 12½ per cent of normal and that of the Saar to 4½ per cent. Hitler's reaction to this desperate situation was a scorched-earth order for the complete obliteration of industry, communications, and transportation systems, but Speer's documents showed that he frustrated the Fuehrer's plans by issuing secret orders of his own forbidding destruction, in order to leave Germany "all possibilities which in the more remote future might be able to insure it a new reconstruction."

Gulfcoast Northern Gas Co. Clarifies Plans for Extension to Texas Area

GULFCOAST NORTHERN GAS CO., which has filed application with the Federal Power Commission for authority to construct an 1,184-mile, 26-in. natural-gas pipe line from the Gulf Coast to the Chicago area, this week announced plans to project its primary line from the point of origin previously published through new and prolific gas fields being developed in the Live Oak County, Texas, area, and thence to Chicago, as originally announced. *(The Oil and Gas Journal, September 2, page 36).*

F. E. Stanley, president of the company, explained: "While the planned change in location will not materially alter the project as originally announced, it will enable the pipe line to serve relatively new and important gas fields which are now without a major pipe-line outlet. A number of gas purchase contracts are now being negotiated by the company with operators owning substantial reserves in the area."

Stanley further stated that he was prompted to make this announcement at this time because of several erroneous statements recently published which were wholly unauthorized by Gulfcoast Northern Gas Co. In this connection, Stanley said:

"1. The management of Gulfcoast has not announced or formulated any plans for a second line. Every effort of our whole group is being directed toward completing at as early a date as possible the initial pipe line, certificate authority for which has been requested.

"2. Plans of the company call for important laterals from the primary line into Louisiana and to the McAllen area in southern Texas, assuming the demand therefore is sufficiently great, which now appears to be the case.

"3. Published statements that the price to be paid for gas by the new line is 10¾ cents per thousand cubic feet are not correct.

"4. Likewise, statements carried in the same publications that units of stock are being reserved for certain officers of the company and that owners of common stock include Midwestern Constructors, Inc., and Fish Engineering Corp. are incorrect.

"5. The recently published statements to the contrary did not originate in Tulsa, and were published without the knowledge or consent of any of the officers or directors of the company. I have reason to believe that the information published was given the press by a competitive source."

Gulfcoast Northern would deliver its gas to Natural Gas Pipeline Co. of America, which supplies gas to Chicago District Pipe Line Co., Peoples Gas Light & Coke Co., Public Service Co. of Northern Illinois, Western United Gas & Electric Co., and Public Service Co. of Northern Indiana.

These companies serving the Chicago area, the application said, "now need in excess of 245,000,000 cu. ft. of natural gas per day to supplement their present supply of gas, and within approximately 1 year after the new line . . . is constructed, will need in excess of 350,000,000 cu. ft. of additional gas per day."

The firm of Doerner, Rinehart & Stuart of Tulsa, which filed the application with the Federal Power Commission for authority to construct a new line, is general counsel for the applicant.

Navy Trying to Develop Fuel from Air and Water

WASHINGTON.—Starting in where German scientists left off at the end of the war, the Office of Naval Research is working on the development of a motor fuel which can be made entirely out of air and water.

The project is top-secret, and few details have been made available, but it has been disclosed that real progress is being made.

Some of the formulas which are being developed were captured by allied scientists who crossed the Rhine with the first American troops.

Next Week

Better Tires From Petroleum Products?—Until as recently as a year ago few people expected G.R.-S. synthetic rubber to remain in the economic picture, but today the situation is reversed. Feature article from the research department of Phillips Petroleum Co. on "New Synthetic Rubber and Oil-Type Carbon Black Make the Best Tires" covers development and commercialization of low-temperature rubber, reinforced with high-abrasion furnace-type carbon black.

Fractionating-Column Instrumentation.—Glenn W. Wilson of Humble Oil's Baytown refinery discusses temperature versus material balance controls, maintenance of instruments, and the new "spilling indicator." He presents 17 figures to illustrate various process-control problems.

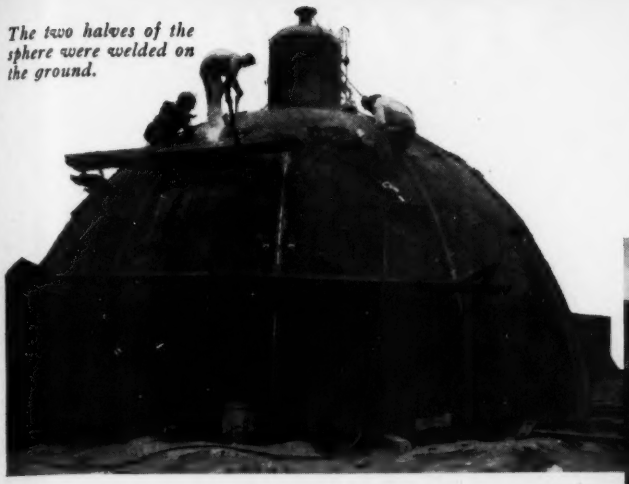
New Tripod-type Derrick.—Designed by Slater Well Service, Victoria, Tex., these unusual portable servicing units have proven very satisfactory on numerous heavy workover and drilling assignments.

Plus or Minus in B.H.P. Measurements?—Two U. S. Bureau of Mines engineers discuss their findings on sources of error in subsurface-pressure-gage calibration and usage, give recommendations and courses of action for improving field use.

Two other U. S. B. M. engineers detail their newly developed wellhead stuffing box for running electric cabled survey-pilot instruments into wells—and which is available without patent restrictions.

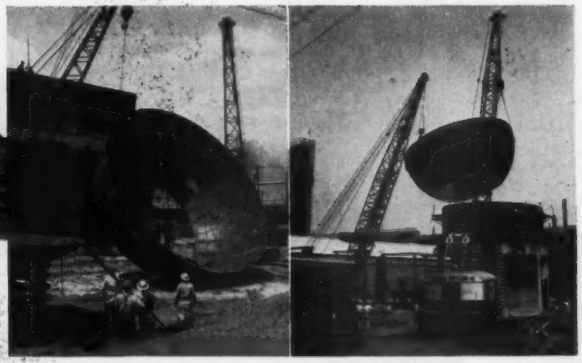
"Wetting" Agent Speeds Pipe-Line Construction.—New procedure by Stanolind Pipe Line Co. cools coated and wrapped pipe three times more quickly, facilitates direct laying into ditch—known as "cradling."

Building the SPHERICAL VACUUM FLASHER for the Shell Oil Company Refinery at Wood River



The two halves of the sphere were welded on the ground.

An alloy-steel clad sphere, 30 ft. in diam. is erected to flash 34,300 bbls. of feed daily to twin cracking units

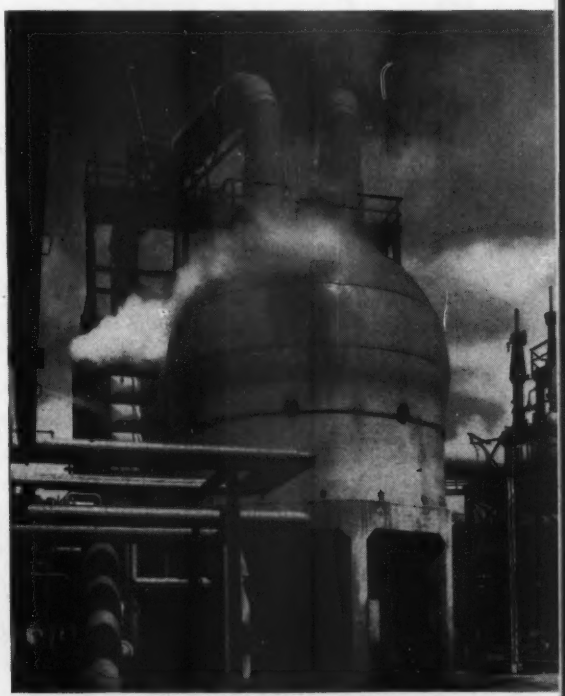


The bottom half of the sphere was lifted by two cranes (left) and set in position on a supporting ring wall (right).

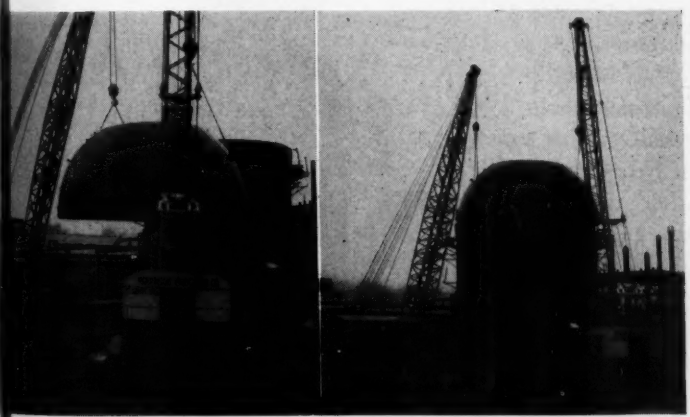
First considerations in the design of this new vacuum flasher, shown here under construction, required that it have an adequate throughput, be capable of long on-stream periods, and be readily accessible for maintenance.

To meet the design requirements, we fabricated this special, alloy-clad sphere, having internal baffling to separate vapor and liquid, and a sump leg to collect residue. The sphere, which is used instead of the conventional cylindrical chamber, operates at 60 mm. Hg. absolute pressure.

The spherical vacuum flasher is one example of the many "custom" steel plate structures which we are equipped to design, fabricate and erect for the petroleum industry. Others include catalytic cracking towers, regenerator towers, and refinery drums. When you need structures like these, write our nearest office for details and quotations.



Completed sphere in operation. Flashed gas oil is supplied to the twin crackers through the two vapor lines above.



The top half of the spherical flasher was picked up by two cranes (left), and landed in position (right) on top of lower half.

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Boston, 10 ..... 1025-201 Devonshire St.
Chicago, 4 ..... 2128 McCormick Bldg.
Cleveland, 15 ..... 2204 Guildhall Bldg.
Detroit, 26 ..... 1514 Lafayette Bldg.
Havana ..... 402 Abreu Bldg.
Houston, 2 ..... 2119 National Standard Bldg.
Los Angeles, 14 ..... 1423 Wm. Fox Bldg.
New York, 6 ..... 3347-165 Broadway Bldg.
Philadelphia, 3 ..... 1615-1700 Walnut Street Bldg.
Salt Lake City, 1 ..... 1525 First Security Bank Bldg.
San Francisco, 11 ..... 1254-22 Battery Street Bldg.
Seattle, 1 ..... 1325 Stuart Bldg.
Tulsa, 3 ..... 1606 Hunt Bldg.

REPRESENTATIVES AND LICENSEES

Horton Steel Works, Limited, Fort Erie, Ontario, Canada
Ateliers et Chantiers de la Seine Maritime, Paris, France
Constructions Metalliques de Provence, Arles-sur-Rhone, France
Compania Tecnica Industrie Petroli, S.A.I., Rome, Italy
Leopoldo Sol & Cia., Reconquista 558, Buenos Aires, Argentina
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PERSONALS

Ball Retires as Director Of Oil and Gas Division

THIS week Max W. Ball, director of the Oil and Gas Division, U. S. Department of Interior since December 1946 and whose resignation is effective December 1, 1948, returns to private consulting practice with offices in Washington, D. C.

Having had active experience in nearly all phases of the oil and gas industry and in government as a scientist, executive, operator and consultant, Ball, previous to his appointment as director of the Oil and Gas Division, had served as chairman of the oil board of the U. S. Geological Survey, engineer and law officer of the U. S. Bureau of Mines, manager of exploration in the Rocky Mountain region for Shell Oil companies, president of Argo Oil Co. and affiliated producing and pipe-line companies, and during the war was with the Petroleum Administration for War as special assistant to the deputy administrator. When not in government practice, he had been in consulting work since 1928.

Ball received his engineer of mines degree from the Colorado School of Mines and his master of law degree from National University. He is a past president of the American Association of Petroleum Geologists, a fellow of the Geological Society of America, a member of the American Institute of Mining and Metallurgical Engineers and the Canadian Institute of Mining and Metallurgy, the bar of the District of Columbia, and has been admitted to practice before the Supreme Court of the United States. He is author of numerous papers and reports on technical and scientific subjects and of a popularly written description of the operations of the petroleum industry, "This Fascinating Oil Business."

Ball had expressed his desire to return to private practice some time ago but at the request of the Department of the Interior, he has remained until now. No successor has been appointed, but Robert E. Friedman, assistant director of the division has been made associate director.

H. E. Oakes, secretary and general counsel of Southland Royalty Co., Fort Worth, Tex., has retired.

Albert Gregersen, director of Danish American Prospecting Co., subsidiary of Gulf Oil Corp., with headquarters in Copenhagen, recently visited in California where he formerly lived.

George W. Hoffman, engineer for Continental Oil Co., has been transferred from Golden, Colo., to Glenrock, Wyo.

V. E. Middlebrook, manager of Shell Oil Co., Inc., gas-gasoline operations in the Mid-Continent area, has resigned to become an engineering consultant with offices in Tulsa. He will specialize in problems relating to plant operating efficiency and in the process and mechanical design for liquefaction of the lighter hydrocarbons such as butane and propane. Prior to his joining Shell 12 years ago Middlebrook had been associated with Coltexo Corp., Phillips Petroleum Co., and Texas Empire Pipe Line Co.

W. M. V. Ash, recently appointed president of Shell Oil Co. of Canada, headquartered at Toronto; and **M. W. Sheppard, Jr.,** land manager, Shell Oil Co., Inc., Los Angeles, were among the nine officials of Canadian and American units of the Royal Dutch-Shell Group in Calgary recently making a survey of the oil activity in Alberta. Other Shell officials included: **A. J. Galloway,** vice president, Shell Oil Co., Inc., New York; **S. F. Bowlby,** vice president, Shell Oil Co., Inc., Los Angeles; **Dr. R. Morse,** exploration manager, Shell Oil Co., Inc., Houston; **Dr. M. G. Edwards,** exploration manager, Shell Oil Co., Inc., Los Angeles; **Leo Newfarmer,** who is to succeed Dr. Edwards when he retires next month; **Dr. W. Gussow,** geological department, Shell Oil Co. of Canada, Ottawa; and **C. J. Warren,** assistant land manager, Shell Oil Co., Inc., Los Angeles.

Paul Moss, Odessa, Tex., director of Independent Petroleum Association of America, has been appointed judge of the Seventieth Texas Judicial District by Gov. Beauford H. Jester.

Stone Wells, attorney for Gulf Oil Corp., Houston, has been named to the board of trustees of Baylor University.

M. G. Benedict will be in charge of Messler-Jackson Oil Corp.'s new Chicago office. Benedict has been associated with John E. Messler Co. for the past 6 years and prior to that had served with Conewango Refining Co. and Sinclair Refining Co.

C. W. Deming, formerly with Georgia Oil and Gas Commission, has resigned to become a consultant and is temporarily located in Chattanooga, Tenn.

Paul Hirth, division manager of Continental Oil Co. in Denver, Colo., has been named chairman of the Rocky Mountain Oil Industry Information Committee. He succeeds **Bud Robineau,** president of Frontier Refining Co.

J. J. McClelland, in the production department of Ohio Oil Co. for 29 years, has been made manager of Columbus district operations for Ohio, in the company's newly opened offices in Columbus, Ohio. **H. G. Walter** will become district geologist of the Columbus district. McClelland was formerly located in Owensboro, Ky., and Walter was located in Tallahassee, Fla.

Arthur L. Clough, manager, southern division, Oklahoma Gas & Electric Co. since 1943, has become executive assistant in the general office in Oklahoma City. **Frank A. Wahlgren,** Muskogee, Okla., eastern division auditor, has replaced Clough in Ardmore, Okla.

L. L. Dresser, Dresser Engineering Co., Tulsa, has been presented a membership in the Alumni Association of the Oklahoma A. & M. chapter of Sigma Tau fraternity, national engineering organization. The award was made in recognition of "outstanding service in the engineering field."

Churchill T. Shelton, production engineer for 21 years with Standard-Vacuum Oil Co.'s producing subsidiary in Indonesia, retired December 1. Shelton first entered the oil business in 1920 with Carter Oil Co. In 1927

PERSONALS

he went to Palembang, Sumatra, for Standard-Vacuum Petroleum Maatschappij (then Nederlandsche Koloniale Petroleum Maatschappij). He remained there until early in 1942 when war brought operations there to a close, and he returned to the United States.

C. H. Wright, Tulsa, president of Sunray Oil Corp., **William W. Porter,** geologist of Sunray, and **E. A. Parkford,** independent oil operator of Pasadena, Calif., have been added to the board of directors of Pacific Petroleum, Ltd., an independent Calgary, Canada, oil company.

J. R. Spencer, formerly with Standard Oil Co. of Texas and California Research Corp., has joined the University of Texas staff as assistant professor of petroleum engineering. Spencer is a graduate of California Institute of Technology. His new job will include part-time research for the Texas Petroleum Research Committee, set up jointly by the university and Texas A. & M. College to investigate production problems.

Glynn Clark, Archer City, and **Howard Bradley,** Dallas, both research fellows at the University of Texas, have been added to the staff of the joint University-Texas A. & M. College secondary recovery oil project — the Texas Petroleum Research Committee.

W. D. Lane, West Texas manager for Plymouth Oil Co. at Midland, Tex., has been elected chairman of the Permian basin chapter of the American Petroleum Institute's production division for 1949. **R. B. Saxe,** Gulf Oil Corp., is the retiring chairman.

H. G. Sole, foreman for Ohio Oil Co., has been transferred from Pauls Valley, Okla., to Eureka, Kans.

W. N. O'Roark, scout for Carter Oil Co., has been elected president of the Shreveport Oil Scouts Association.

F. L. Rice, manager of the public relations department of Phillips Petroleum Co., has been elected to the board of directors for the southern region of the Public Relations Society of America at its recent annual meeting in Chicago.

Bill Gray, former scout at Shawnee, Okla., for Sun Oil Co., and now in the company's land department, has been transferred to Amarillo, Tex., where he will head a new land district.

C. L. McArthur, formerly district landman at Abilene, Tex., for Lion Oil Co., has been named manager of the company's new office at Corpus Christi, Tex. **Louis Weltman** has been transferred from Jackson, Miss., to become district geologist in the Corpus Christi office.

Yale Lewis and **Alan Hachenberger,** independent operators of Evansville, Ind., have dissolved their former joint working arrangement and will now operate independently.

Raoul Bethancourt, Sun Oil Co., Corpus Christi, has been elected chairman of the Southwest Texas section of the American Institute of Mining and Metallurgical Engineers. Other officers for 1949 include: **Charles Snellson,** Seaboard Oil Co. of Delaware, Corpus Christi, vice chairman; **R. C. Granberry,** Humble Oil & Refining Co., Corpus Christi, secretary-treasurer. New directors of the chapter are: **H. N. Lyle,** Engineering Service Co., Corpus Christi, retiring chairman; **Emil Bowers,** Southern Minerals Corp., Corpus Christi; **Harold Mosley,** B & W Tool Co., Corpus Christi; **Lee Thronson,** Sun Oil Co., McAllen, Tex., and **Barrett Booth,** Houston Oil Co., Beeville.

Park Briscoe, superintendent of Minard Run Oil Co., was elected to the board of directors of the Bradford district, Pennsylvania Oil Producers Association at a recent meeting of the group in Bradford.

William J. Wilkins, chief engineer, Tulsa pipeline division, Gulf Refining Co., Tulsa, will leave the United States early this month for Kuwait, where he will act in the capacity of executive assistant to the general manager of Kuwait Oil Co., Ltd. His activities will center in general and pipe-line construction. He will be in Kuwait for approximately a year.

C. B. McClintock, consultant geologist and petroleum engineer of Oil City, Pa., has joined the staff of Wolf's Head Oil Refining Co. as chief geologist and petroleum engineer. He has had experience in the production phase of the oil industry in the United States and in several foreign countries.

Elmer Hanlin, tank-truck driver for Continental Oil Co. at Denver, Colo., was recently honored at a dinner in tribute to his 42 years' service without an accident and without loss of time due to illness. He was presented an award by **L. F. McCollum,** president of Continental.

John Norton has been appointed assistant process superintendent at Bayonne refinery for Esso Standard Oil Co., and **John E. Hughey** has been named technical assistant to the process superintendent, **Charles E. Borgstrand.** Norton, who is a graduate of Syracuse University, joined the company in 1934. Hughey joined Esso in 1938 after graduating from the University of Pittsburgh.

Mary P. Bell, George R. Bell, and **Russell C. Phillips** have organized Bell-Phillips Co., Wichita, Kans., a partnership, to continue the lease and royalty business formerly conducted by the late Joe A. Bell. Phillips was formerly in the land and legal department of Anderson - Prichard Oil Corp., Oklahoma City.

NEW OFFICERS OF ROCKY MOUNTAIN ASSOCIATION

Officers of the Rocky Mountain Oil and Gas Association elected at the annual meeting in Denver November 20: J. F. Cullen, Stanolind Oil & Gas Co., vice president; Charles S. Hill, Denver independent producer, vice president; H. A. Stewart, Denver consulting geologist, outgoing president; E. J. Sullivan, parliamentarian; Glenn E. Neilson, Husky Refining Co., president; R. B. Curran, W. H. Barber Co., vice president. Not shown are Gilbert J. Mueller, Argo Oil Co., treasurer; and Frank C. Fogarty, executive secretary of the association

Roland V. Rodman, president of Anderson-Prichard Oil Corp., will appear before the Capehart Committee in Washington to represent petroleum refiners in an investigation by that committee of industrial geographic pricing policies.

Z. E. Woods, engineer for Phillips Petroleum Co., has been transferred from Bartlesville, Okla., to Phillips, Tex.

Paul M. Allen, Jr., recent graduate of Bucknell University, and **James F. Baechtel,** recent graduate of Grove City (Pa.), College, have been named district engineers for associated companies in the Pittsburgh Group of Columbia Gas System, Inc.

Leroy V. Hester, engineer for Stanolind Oil & Gas Co., has been transferred from Ulysses, Kans., to Oklahoma City.

E. H. Shaw, district land man in the Permian basin for Richfield Oil Corp., has resigned effective January 1 to become an independent lease and mineral broker.

H. F. Harrington, head of the tax department of The Texas Co. at Houston, is chairman of the annual ad valorem tax forum of the Mid-Continent Oil and Gas Association which will hold its tax conference December 16-17 in Fort Worth.

Wayne J. Brawley, who has served as resident manager with Northern Ordnance, Inc., and who has been in oil-industry activities since 1928, has set up offices as consulting petroleum geologist and engineer in Titusville, Pa.

J. Howard Robinson has been appointed manager of Union Oil Co.'s pipe-line operations and communications, succeeding the late W. W. Hay. Robinson joined Union Oil as a roustabout in 1920. He will be succeeded as superintendent of the northern division pipe lines by **N. T. Ugrin.**

Sylvain J. Pirson will join the Stanolind Oil & Gas Co., Tulsa, the first of the year to engage in research on reservoir engineering. The past 13 years Dr. Pirson has been at Pennsylvania State College, first in charge of petroleum engineering and later as head of the division of geophysics and geochemistry. A native of Belgium, Pirson graduated from the University of Louvain and later obtained advanced degrees from the University of Pittsburgh and the Colorado School of Mines. He was with Gulf Research & Development Co. before going to Penn State. Pirson has written a number of articles on petroleum engineering and electric logging for The Oil and Gas Journal.

SHIFTS—

N. B. Frickman, engineer, Humble Oil & Refining Co., New Orleans to New Iberia, La.; **A. C. Christenson,** superintendent, Stanolind Oil & Gas Co., Crestview, Fla., to Shreveport, La.; **M. E. Marks,** engineer, Pure Oil Co., Cary to Crystal Lake, Ill.; **R. C. Heil,** engineer, The Texas Co., Farnia to Salem, Ill.; **Harold Underwood,** engineer, Texas Eastern Transportation Co., Oran, Mo., to Williamsport, Ohio.

Fritz G. Nagel, geologist, Ohio Oil Co., Durango, Colo., to Oraibi, Ariz.; **Robin J. Corbett,** engineer, Sharples Oil Corp., Golden to Denver, Colo.; **George T. Crisman,** engineer, Magnolia Pipe Line Co., Duncan, Okla., to Seagraves, Tex.; **Charles N. Hefner,** engineer, Mud Control Laboratories, Inc., Lindsay to Oklahoma City; **W. P. Larkin,** superintendent, McCarthy Drilling Co., Angleton, Tex., to Bakersfield, Calif.

Morris Ivy, foreman, Phillips Petroleum Co., Andrews to Fullerton, Tex.; **C. W. Armstrong,** engineer, Humble Oil & Refining Co., Beaumont to Houston, Tex.; **W. C. Guess,** foreman, Sun Oil Co., Beaumont, Tex., to Morgan City, La.; **J. W. Workman,** superintendent, Humble Oil & Refining Co., Beaumont to Monroe City, Tex.; **Jack W. Williamson,** engineer, Continental Oil Co., Big Spring to North Cowden, Tex.

Ervin L. Turner, engineer, Stanolind Oil & Gas Co., Brownfield to Floydada, Tex.; **H. M. Singleton,** chemist, Humble Oil & Refining Co., Goose Creek to Baytown, Tex.; **James R. Bowen,** engineer, Shell Oil Co., Inc., Houston, Tex., to St. Albans, N. Y.; **J. L. Lamberson, Jr.,** engineer, Humble Oil & Refining Co., Houston to Sugarland, Tex.; **Sherman Fehl,** foreman, Warren Oil Corp., Jacksboro to Graham, Tex.; **A. E. Shirley,** superintendent, Parker Drilling Co., Kermit, Tex., to Marksville, La.

H. S. Wright, superintendent, Rock Hill Oil Co., Victoria, Tex., to Ardmore, Okla.; **W. T. Hudson,** engineer, The California Co., New Orleans, La., to Denver, Colo.; **Ivan H. Spoor, Jr.,** engineer, Universal Oil Products Co., Chicago, Ill., to Pasadena, Tex.; **Ray A. Edwards,** engineer, Warren Petroleum Co., Crossville, Ill., to Lindsay, Okla.; **J. F. Renfro, Jr.,** superintendent, Pioneer Drilling Co., Riverton to Lander, Wyo.; **Carl H. Carter,** foreman, Barnsdall Oil Co., Barnsdall to Osage, Okla.

R. G. Tonkin, engineer, Humble Oil & Refining Co., Corpus Christi to Refugio, Tex.; **W. L. Crothers,** engineer, Humble Oil & Refining Co., Houston to Midland, Tex.; **John A. Weideman,** engineer, Atlantic Refining Co., Odessa, Tex., to Lakeland, Fla.; **Jacque L. Williams,** superintendent, Humble Oil & Refining Co., Brookhaven, Miss., to Grand Isle, La.; **Guy I. McCracken,** geologist, Gulf Research & Development Co., Pittsburgh, Pa., to Tulsa; **C. A. Miller,** superintendent, Kerr-McGee Oil Industries, Inc., Artesia, Colo., to Powell, Wyo.

DEATHS

Brent Skinner Drane, 67, former member of the National Resources Planning Board and state geologist and director of the North Carolina Geological and Economic Survey, died November 23 in Durham, N. C.

William Browning Washington, 58, Dallas and Longview, Tex., oil operator, died November 20 in Long Beach, Calif.

George W. Simpson, 66, retired Pennsylvania oil producer, died November 11 in Buffalo, N. Y.

Lee R. Saunders, 56, chairman of Saunders Petroleum Co., died November 21 in Chicago, Ill.

Henry H. Herman, 85, drilling contractor, Ranger, Tex., died November 21 in Ranger.

Thomas S. Holt, 76, founder of Holt Oil Co., died November 21 in Federalsburg, Md.

Harry W. Peter, 60, field superintendent for Merrick Oil Co., and **W. A. Teague,** drilling superintendent for Merrick, were killed by a collapsing oil derrick November 25 at West Columbia, Tex.

F. W. Cumberworth, 44, advertising and public relations representative for the Grand Rapids sales field of Standard Oil Co. (Ind.), died November 26 in Highland Park, Ill.

Byron Dudley Florea, 56, land agent for Amerada Oil Co., was killed near Kilgore, Tex., in an automobile accident November 21.

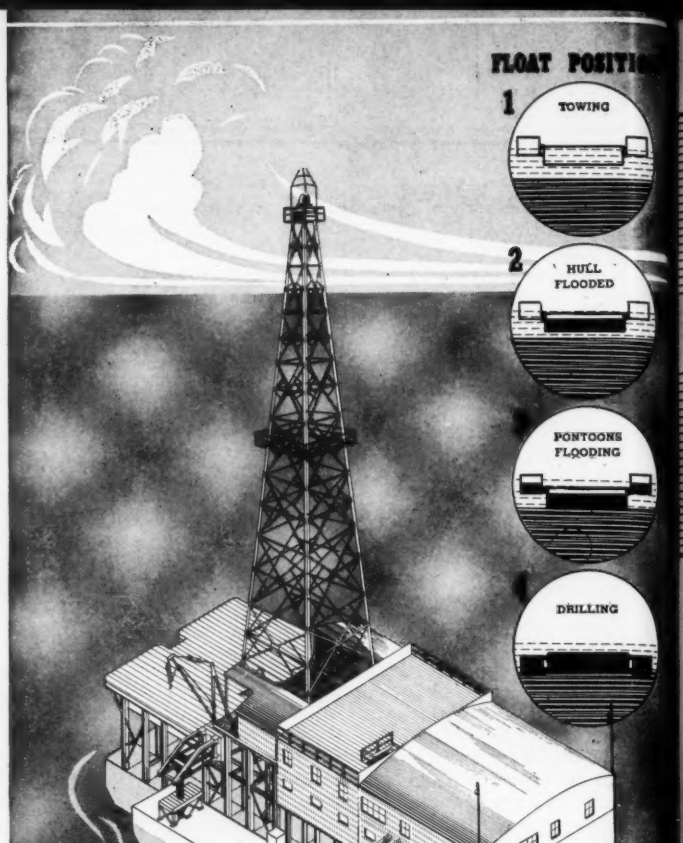
Titus Sheard Hose, 58, petroleum engineer who discovered Hose field in Nolan County, Texas, in 1939, died November 24 near Millerton, N. Y.

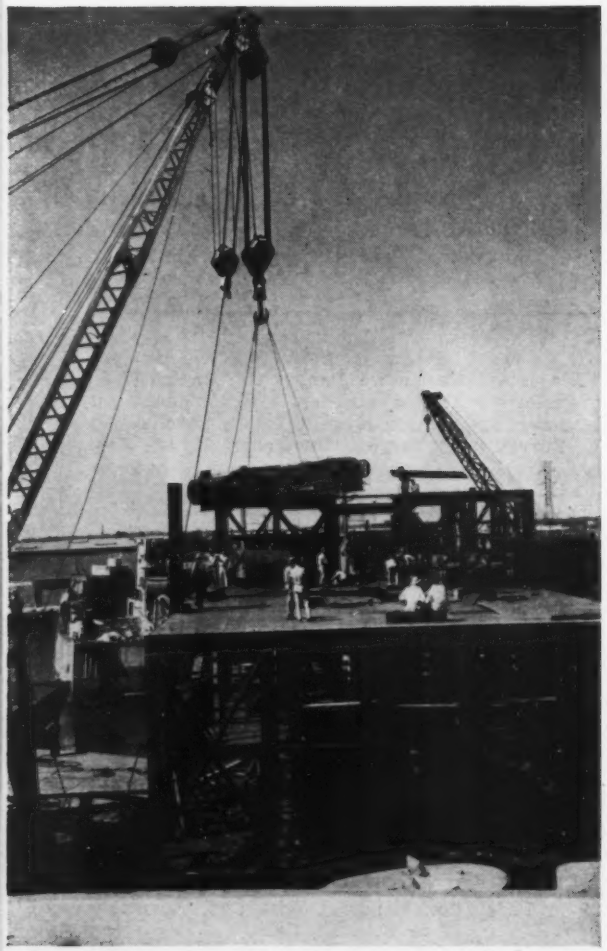
H. M. Robinson, 59, Oklahoma-Kansas representative for Macwhyte Co., Kenosha, Wis., died November 18 in Bokoshe, Okla.

stabilized Sea Drill

Barnsdall Makes Radical Departure From Present Offshore Drilling Practice

by Leigh S. McCaslin, Jr.





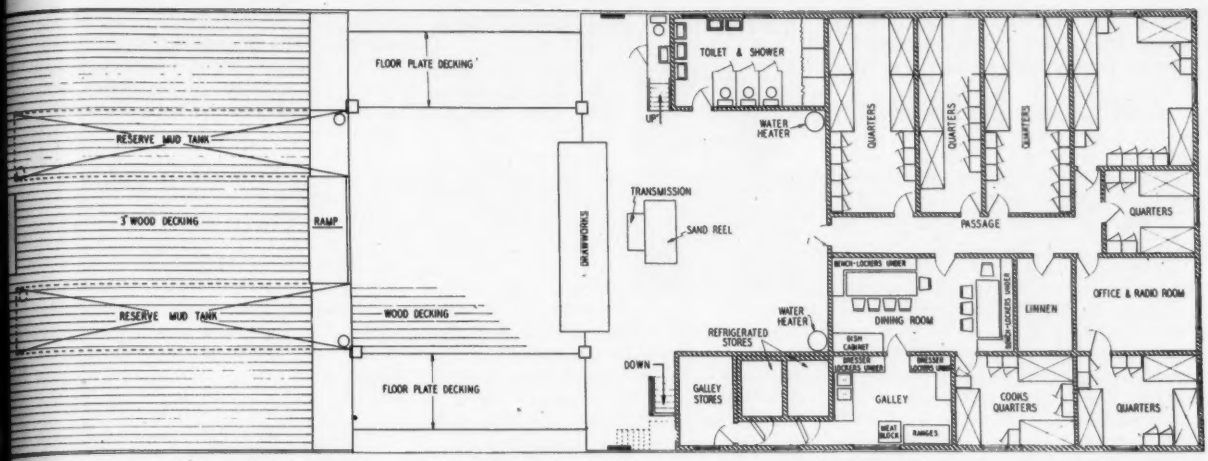
Above: The new Barnsdall-Seaboard-Callery & Hurt offshore drilling equipment is designed for speedy "location-to-location" moves, with the drilling derrick and all equipment an integral part of the unit. The Journal's isometric sketch of the design shows principal details, the insets show the four positions of the barge hull and pontoons during the sinking of the structure to the ocean bed. The "outrigger" pontoons provide stability during the flooding operation

Left: Shipyard crane is lowering the drilling-engine transmission unit on the mud pump-drilling engine deck of Barnsdall et al's new drilling structure. Another level will be built above the deck seen in the picture, for crew's quarters and other housekeeping facilities

A NEW and radically different type of a structure for drilling in the unprotected waters of the Gulf of Mexico—which can best be described as a "stabilized sea drill"—is currently being built at a New Orleans shipyard. This unique drilling barge is a joint venture of Barnsdall Oil Co., Seaboard Oil Co., and Callery & Hurt, with Barnsdall as the designer and future operator.

As can be seen from the accompanying drawing by The Oil and Gas Journal's staff artist, the submarine drilling barge or "stabilized sea drill" marks a radical departure from present offshore-drilling practices. In brief, the drilling equipment is supported by what might be described as a floating pile foundation. The piles are attached at their base to a large barge which, when flooded, causes the entire structure to sink to the ocean floor. Stability during flooding is provided by two large adjustable "outrigger" pontoons on each side of the structure.

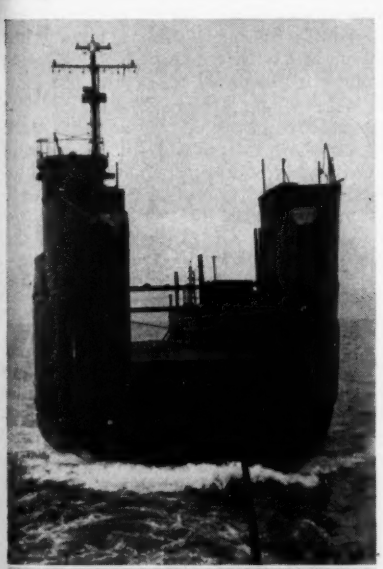
The entire structure, with drilling equipment aboard, will weigh 1,120

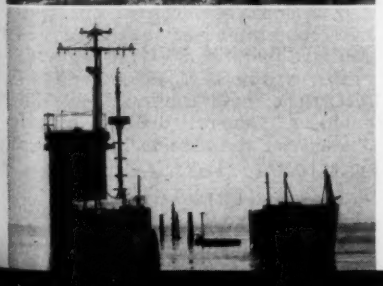


Plan view of the upper deck of the radically new drilling structure. Pipe racks will be built on top of the reserve mud tanks shown in the drawing. A play deck for crew members is planned on the roof of the living area

tons. Drilling rig to be used is the Emsco Derrick & Equipment Co. J-1600 which has a rated depth capacity of 16,000 ft. with 4½-in. drill pipe. Derrick will be a 136 by 30-ft. Emsco galvanized, 800,000-lb., unreinforced structure.

This 204-ft. war-surplus L.S.M. was towed to a point 150 ft. from the first location for Barnsdall et al's new submarine drilling barge, then sunk to rest on the ocean floor. Purpose behind this test was to determine what scouring action might be expected around the base of the new drilling barge. Test piling also was driven nearby to obtain information as to the probable cost of the more conventional piling platform structure





The primary motivation behind the development of the submarine drilling barge has been economic—to reduce the cost of offshore drilling. It is expected actually to cost less than conventional piling platforms in the same depth of water (18-22 ft. at the proposed location). In addition, and of primary importance, is the fact that it will be 100 per cent salvable. At the completion of a well, the water can be pumped out of the barge, thus floating the entire structure in readiness for towing to another location.

From a design standpoint, the main features of the submarine drilling barge are (1) a very open structure at water level minimizes wave action, and (2) only negligible changes in the displacement of the structure occur with changes in water level.

Knowing that wave action in the open sea is strongest at the surface, the designers have minimized the structure area exposed to this surface wave action. The open piling supporting the drilling equipment and crews quarters offers the only resistance at water level. The solid vertical surfaces of the barge are submerged and are thus the target of only the relatively minor underwater wave action. The fact that the barge is submerged is also responsible for the negligible changes in displacement of the over-all structure as the water level rises and falls.

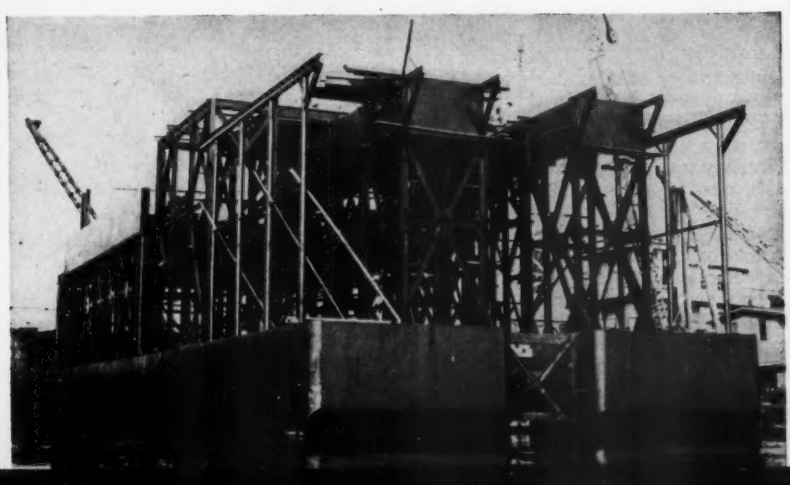
160 ft. Long

A detailed description of the Barnsdall et al barge can perhaps best be given by describing it level by level starting at the bottom.

The base of the structure is composed of a 160 by 54 by 13-ft. compartmented barge with a drilling slot 10 ft. wide by 75 ft. long. This hull is divided into 13 separate compartments (not including two rake ends on bow and stern). In addition to flood compartments for sinking the drilling barge, there are storage compartments for diesel fuel, fresh water, and drilling water. The drilling-water tank will handle 2,250 bbl. and the fresh-water and diesel tanks each hold 942 bbl.

The pumps used to flood the compartments and to transfer fresh water, diesel oil, and drilling water are located in a 20 by 13-ft.-4-in. pump room inside the hull. Control is from an upper deck level, but a 40-in.-diameter vertical passageway is provided for

Over-all view of the submarine drilling barge under construction. Drilling slot can be seen in center of barge hull



access. For dewatering the compartments, four 1,500 g.p.m., electrically-driven, centrifugal pumps are provided.

The two huge stabilizing pontoons mounted on either side of the barge hull are 100 by 14 by 12 ft. and weigh 180 tons each. The pontoons are mounted 1 ft. away from the hull and their vertical position is regulated by a jack mechanism. Their total displacement is 1,132.9 short tons.

The first of the two upper-deck levels contains the drilling engines, engine transmission, mud pumps, and two 400-bbl. active mud tanks. Both levels will be completely housed in and are located on the stern of the barge as can be seen in the drawing.

On the second level will be draw works, sand reel, living quarters, galley, toilet and shower, office and radio room, dining room, and linen locker. The living quarters will be completely air conditioned.

Sinking Procedure

First step in sinking the submarine drilling barge on the ocean floor, is to open the sea cocks on the main barge (see drawing). It is then planned to flood the barge until the two pontoons are taking a good bit of the load (probably when the 13-ft.-high barge hull lacks 2 ft. of being submerged). As soon as the top deck of the submersible barge is under water, the whole structure will be dependent upon the pontoons for stability.

Flooding of both pontoons and barge hull will then continue with the aim of keeping a positive downward force on pontoons and barge until the structure reaches bottom. A jack mechanism will control the pontoons and can be used to level the barge and control the disposition of weight on the barge. The pontoons are designed to go 2 ft. lower than the barge hull, if necessary. In their sunken position, the pontoons will serve as protection against scour around the bottom edges of the barge.

Conceived by Hayward

Originator of the idea of a submarine drilling barge is J. T. Hayward, vice president of Barnsdall Research Corp. Fundamental design work was done by Barnsdall Research Corp. and structural design details have been worked out by Alexander Shipyards, Inc., New Orleans, where the barge is being built. Leslie B. Durant is general manager of Alexander and W. E. Padel is chief engineer.

Before embarking upon actual construction, Hayward and G. E. McClatchey, drilling engineer for Barnsdall, carried on some extremely interesting test work. The primary purpose of the test work was to ascertain what scouring action might be expected around the base of the barge in its sunken position. A previous well drilled by Barnsdall et al in the same general location as the proposed test encountered considerable scouring action. It was sufficiently serious, in fact, that the crown block had to be jacked over as far as possible to counteract the effect of the scour.

This previous well was Barnsdall et al 1 State Lease 1230, Block 36, in the Breton Sound area a few hundred feet off Breton Island. Since this location was not in open water, a Noble Drilling Corp. swamp barge was used for the well. The proposed location for the first job of the submarine drilling barge is roughly 5 miles north of the old location. This places it 18 miles from the mainland and 5 miles off Breton Island.

Two methods were used to determine the scouring action to be expected at the proposed location. First, model studies were conducted (see pictures), and secondly a 204-ft. war-surplus L.S.M. (landing ship, medium) was towed to the proposed well site and sunk.

The model tests were conducted in a 10 by 25-ft. tank using a model of the submarine drilling barge scaled at one-fortieth actual size. The bottom of the tank was covered with 4 in. of very fine silty sand and a water level maintained in the tank equivalent to 20 ft. in the prototype. Currents were induced by a circulating pump and by running water from the city supply into the tank at one end opposite an overflow.

Results of the model studies showed practically no scour occurring around the barge. However, considerable deposition occurred on the downstream side of the barge, on top of the pontoons, and on top of the hull.

The L.S.M. was stripped down to its hull and towed to the Breton Sound area where its 480 tons of steel were sunk 150 ft. from the future well site. It was fully equipped with navigation lights and, in addition, wave-recording and inclination-recording gear was mounted on the craft. McClatchey visited the L.S.M. once a week via shrimp boat or amphibian plane to check on its condition. Results obtained with the L.S.M. checked closely with those from the model studies.

Forethought was used in the placing of the L.S.M. It was sunk to the northeast of the proposed location—the direction from which the heaviest seas can reach the future well site. Thus it will serve as a breakwater for the submarine drilling barge. In addition, it will make a convenient tie-up point and breakwater for the service boats which will be making runs to the location.

At the same time the L.S.M. was sunk, a test piling was driven in the area. The purpose of this piling was to obtain general information for compiling an estimate on the cost of a conventional piling platform. Cost comparisons with a piling platform were used to help convince management of the advantages of the submersible drilling barge.

To Be Towed to Sea

Upon completion, the submarine drilling barge will be towed from New Orleans to the open sea without derrick and stabilizing pontoons because of bridges and narrow passageways en route. It will then be anchored in some protected spot while the pontoons are added and the derrick erected.

H. D. Jones of Barnsdall will be district superintendent in charge when drilling operations commence. Toolpusher will be T. M. Poteet, and G. E. McClatchey will continue as drilling engineer. General drilling superintendent for the area is Tom Cline of Shreveport.

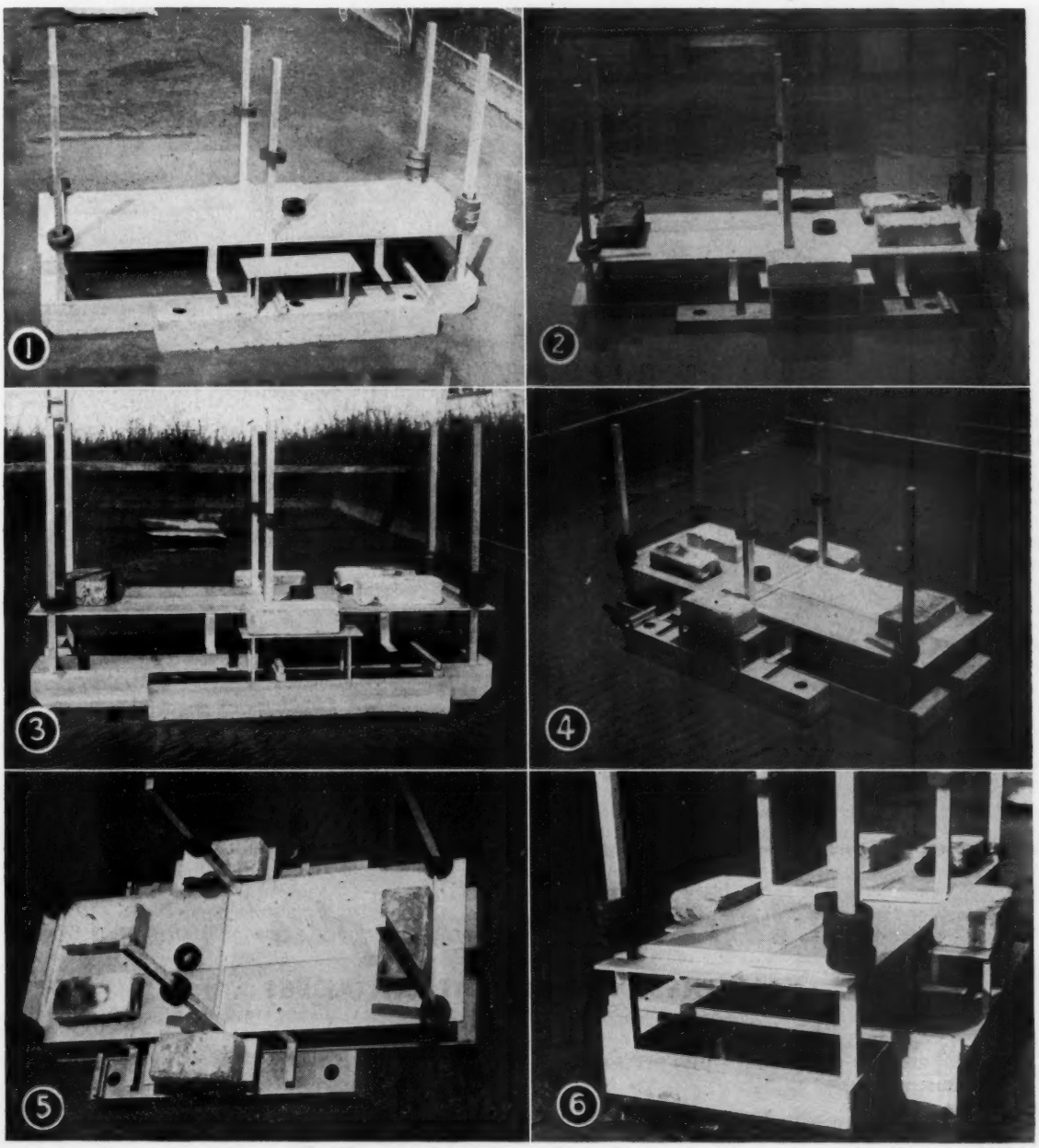
INVENTOR and DESIGNER

John T. Hayward is the inventor and designer of the unusual offshore drilling barge described in this article. He is vice president of Barnsdall Research Corp., Tulsa, and the inventor of the well-known mud-logging system and the Hayward automatic permeameter, and the author of many petroleum-engineering papers. He received the Distinguished Civilian Service Award in the late war for antisubmarine defense work. His engineering education was obtained at Liverpool, England.

Hayward was a marine engineer at Belfast, Ireland, before entering petroleum-engineering work in Romania. He was pushing tools there in 1913 when the first rotary rig arrived and he supervised the drilling of the first rotary drilled oil well in that part of the world. In 1927 he made a trip to the United States to purchase oil-field equipment, and in 1929 moved to Tulsa. In 1931 he became chief engineer for Barnsdall.

T. M. Poteet, tool pusher for Barnsdall, and G. E. McClatchey, drilling engineer, discuss a design feature of the mud-pump deck of the new drilling structure

Model Studies Conducted to Determine Scouring Action



MODEL studies were conducted in New Orleans by G. E. McClatchey, Barnsdall drilling engineer, to determine the scouring action to be expected around the base of the marine drilling barge. The bottom of the test tank was covered with 4 in. of very fine, silty sand and a water level maintained in the tank, equivalent to 20 ft. as in the Gulf of Mexico. Simulated gulf currents were induced by circulating water with a pump, and by running water from the city supply into the tank at one end opposite an overflow. The pictures show the following: (1) Model in dry tank resting on 4 in. of sand and ready for the water. (2) Tank filled to test level with bricks and washers on the model to add the desired amount of weight. Pontoons are completely submerged, but the water is so clear that they do not appear so. (3) Picture from downstream side of barge taken when tank was drained following 8 hours of continuous water circulation. Note deposition along pontoon. (4) Upstream view of model after tank was drained. Only point of scour is at the right-hand corner of pontoon and this is very slight. (5) Pattern in the silt on the bottom of the tank shows the path the current took when approaching the model. Note the "plateau" around the edges of the barge, relatively undisturbed by the currents. Water flow was from bottom to top across the picture. (6) Closeup of downstream end of barge after test. Note deposition behind pontoon and behind rake of barge.

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Instrumentation

by Glenn W. Wilson

PART 1

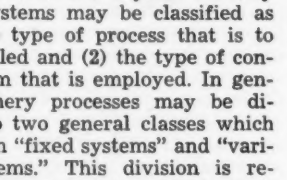
THE last 15 years have witnessed a rather astounding series of changes in the fractionation requirements of the petroleum industry. More and more emphasis has been placed on precise fractionation and, as a result, the 10-plate bubble tower with its temperature controller that held the top vapor temperature to within ±25° F. is as archaic as the Stanley Steamer automobile. In addition to a progressive increase in the number of plates and/or the tower diameters there has been a decided change in the manner in which fractionation columns are utilized.

Prior to the mid thirties, refiners were interested in light ends chiefly from the standpoint of getting them out of their motor-gasoline streams, and one-tower stabilization operations were quite common. By 1936 a few of the major oil companies were polymerizing butylenes; and the three-tower stabilization operation involving depropanization, debutanization, and depentanization replaced or supplemented the one-tower operation.

The year 1938 might well be called one of the "golden years" in the petroleum industry for that year marked the birth of alkylation. The discovery of this rather simple process for combining isobutane with C_3, C_4 and C_5 olefins to give a high-octane saturated paraffin started a boom in the aviation-gasoline business and laid the foundation for the 100-octane program which contributed so heavily to the winning of World War II. Alkylation was followed in rapid succession by catalytic cracking, hydroforming, isomerization, and synthetic rubber. Each of these processes requires precise fractionation of either the feed stock or the products, and today multiplate fractionation columns are almost as commonplace as storage tanks. So much for the evolution of our refinery processes.

Suppose we now consider the problem of controlling the fractionation equipment associated with some of these processes. The myriad refinery control systems may be classified as to (1) the type of process that is to be controlled and (2) the type of control system that is employed. In general, refinery processes may be divided into two general classes which I will term "fixed systems" and "variable systems." This division is related to the flexibility that is built into the equipment, the **fixed system** being defined as one in which the towers do the same job day in and day out and the only changes are occasioned by variation in charge rate or charge composition. The **variable system** is defined as one in which a given set of towers is used for a variety of operations, and it is necessary to switch back and forth from one operation to the other.

In a similar manner the control systems may be divided into two fundamental groups; those directed toward establishing a prescribed material balance, and those directed toward controlling the temperature level at some point in the system. This arbitrary type of classification permits us to describe a control system as one of the following general types: (a) fixed system on material



Glenn W. Wilson is senior chemical engineer, technical service division, refining department, Humble Oil & Refining Co., Baytown, Tex. Born and reared in Houston, he attended Rice Institute and received B.S. degree in chemical engineering in 1935 and joined Humble at Baytown the same year. Wilson's first years were in process-control work on thermal cracking units. With World War II, he moved into light-ends fractionation and production of aviation gasoline and toluene. Production of solvents and special naphthas is now one of his major activities. Wilson is a member of the American Chemical Society; has been granted several patents relating to petroleum refining, including the "spilling indicator" discussed in this paper.

The material in this article was a feature presentation at the recent Texas A. & M. College short course "Instrumentation for the Process Industries."

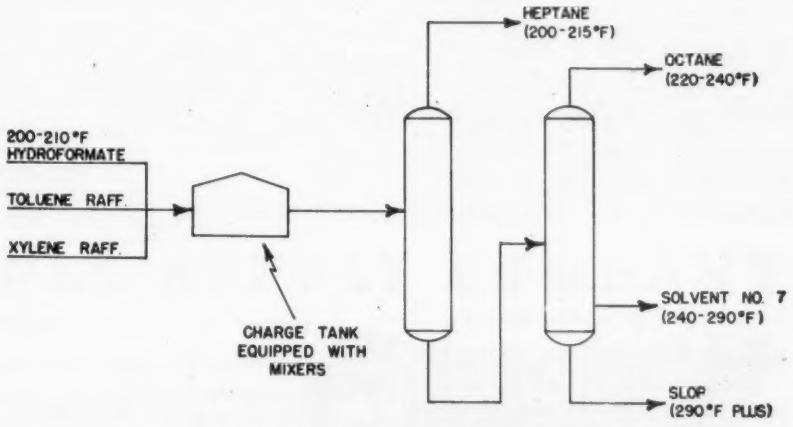


Fig. 1—Solvents operation—process flow

balance, (b) fixed system on temperature control, (c) variable system on material balance, and (d) variable system on temperature control.

A major portion of this discussion will be devoted to examples of various types of control systems which, as a matter of record, are found in the Baytown refinery of Humble Oil & Refining Co. but might well be found in any large petroleum refinery.

Fixed System on Material Balance Control

The simplest type of control system is, of course, the fixed system on material balance control. Fig. 1 presents the process flow for a solvents operation that employs this type of control. Here the feed enters on rate-of-flow control; the overhead products from both towers are on rate-of-flow control; the slop stream from the bottom of the second tower is on rate-of-flow, and the remaining stream, the sidestream from the second tower, is on liquid-level control. This operation is scheduled only 4-5 days each month, and as a result it is possible to accumulate the three streams which comprise the charge stock (200°-210° F. hydroformate, toluene raffinate, and xylene raffinate) in a single 80,000-bbl. tank.

This tank is equipped with propeller-type mixers, and it has been demonstrated that a 30-minute mixing period will insure absolute uniformity in feed-stock composition. A laboratory evaluation of each new batch of feed stock serves as a guide for establishing the flow rates to be employed in the plant-scale run.

Fixed System on Temperature Control

Fig. 2 outlines the process flow for a fixed system employing temperature control. This operation involves the stabilization of the gasoline fraction from a catalytic cracking operation and the subsequent segregation of the propane, butane, and pentane fractions. Although this system undergoes some variation in charge rate and charge composition as a result of variations in conversion level on the catalytic unit, these changes normally take place over an extended period of time and it is possible to attain excellent control. In view of the fact that this unit employs a wide variety of temperature and pressure control systems, this operation will be discussed here in detail before passing on to the variable systems.

Initial step in the process is the stabilization (in this particular case depentanization) of a mixture of rich oil from the absorption operation and unstable naphtha from the primary tower. The overhead stream from this operation is then depropanized and debutanized to yield a pentane concentrate, while the bottoms are fractionated into a light catalytic naphtha and a heavy catalytic naphtha as dictated by volatility requirements on the motor gasoline pool. Fig. 3 details the instrumentation for the stabilization and rerun operations.

Perhaps the most unusual feature of this system (aside from the fact that the plates are numbered from top to bottom rather than from bottom to top) is the use of a single furnace to provide heat from both towers. The overflow from the bottom plate of the prefractionator tower is pumped to the reboiler furnace, heated to approximately 550° F. and returned to the reservoir section where some 40 per cent is flashed up the tower. The remainder, which constitutes the bottoms product, is routed to the rerun tower.

A pressure differential of 165 lb. permits the use of the prefractionator bottoms as a source of heat for reboiling the rerun tower. A liquid-level recorder on the trap-out section serves as a guide for manual adjustment of heat input and/or reflux rates to insure satisfactory suction

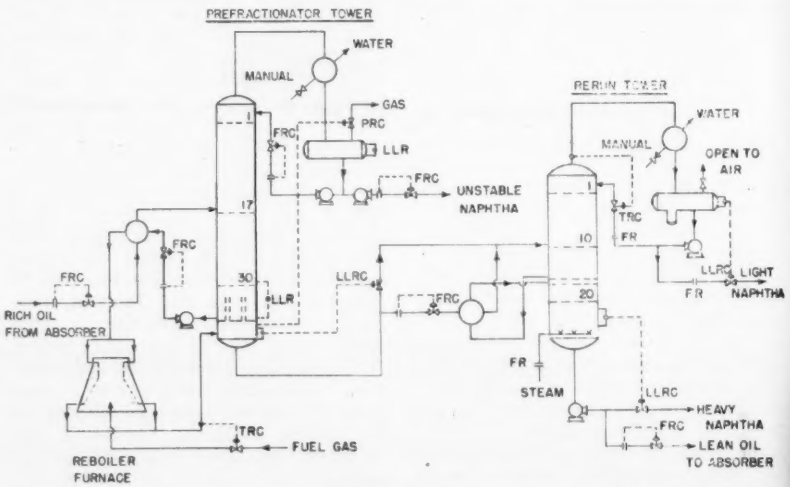


Fig. 3—Instrumentation of prefractionator and rerun towers—catalytic light ends unit

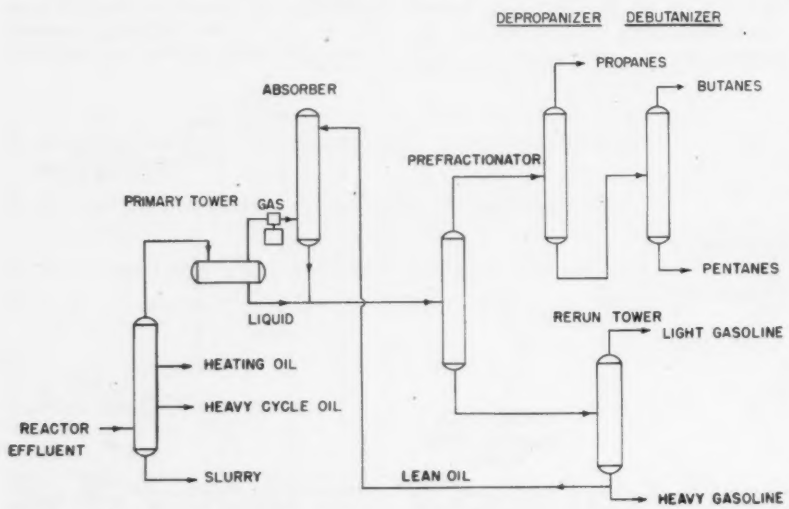


Fig. 2—Catalytic light ends unit—process flow

conditions for the furnace circulation pump.

In setting up the instrumentation on the prefractionator, primary consideration was given to lining out the flow to succeeding columns, the overhead being routed to the depropanizer on rate-of-flow control while the bottoms stream is split approximately 90-10. The larger stream is on rate-of-flow control through the rerun tower reboiler, and the smaller stream on liquid level control directly to the rerun tower. The 30 plates in the prefractionator tower permit satisfactory depentanization of some 38,000 bbl. per day of naphtha, of which approximately 18,000 bbl. is rich oil from the absorber operation. The temperature level in the tower is adjusted by varying the coil outlet temperature on the reboiler furnace (which in turn controls the fuel gas). However, in view of the fact that coil

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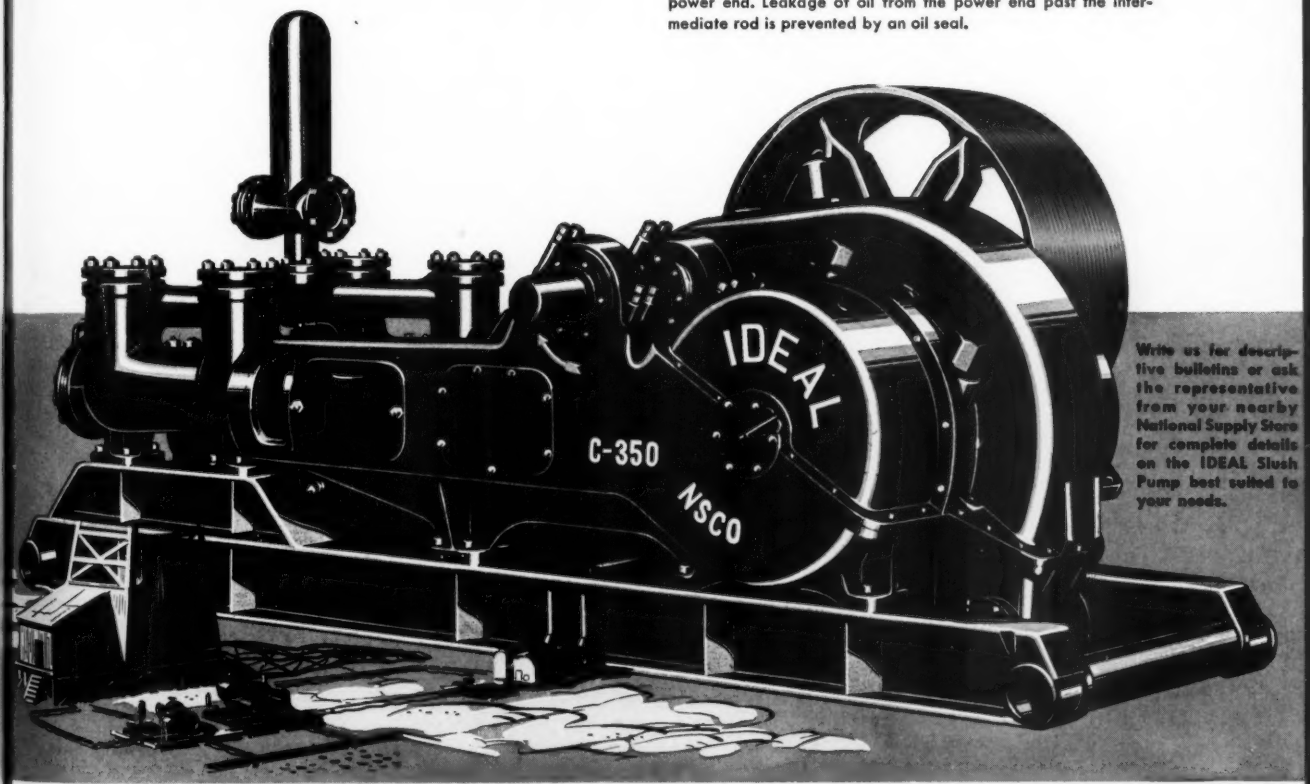

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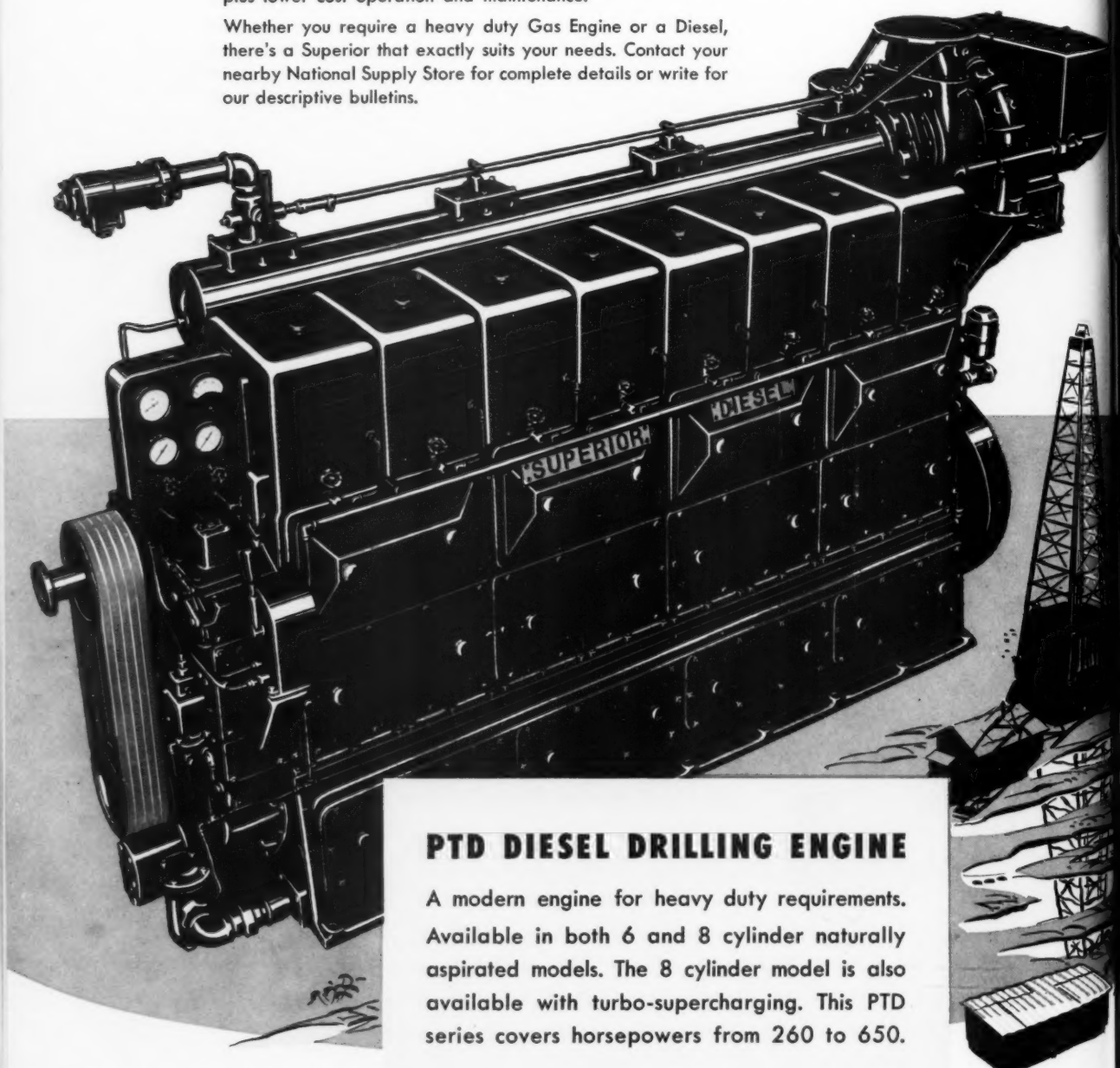

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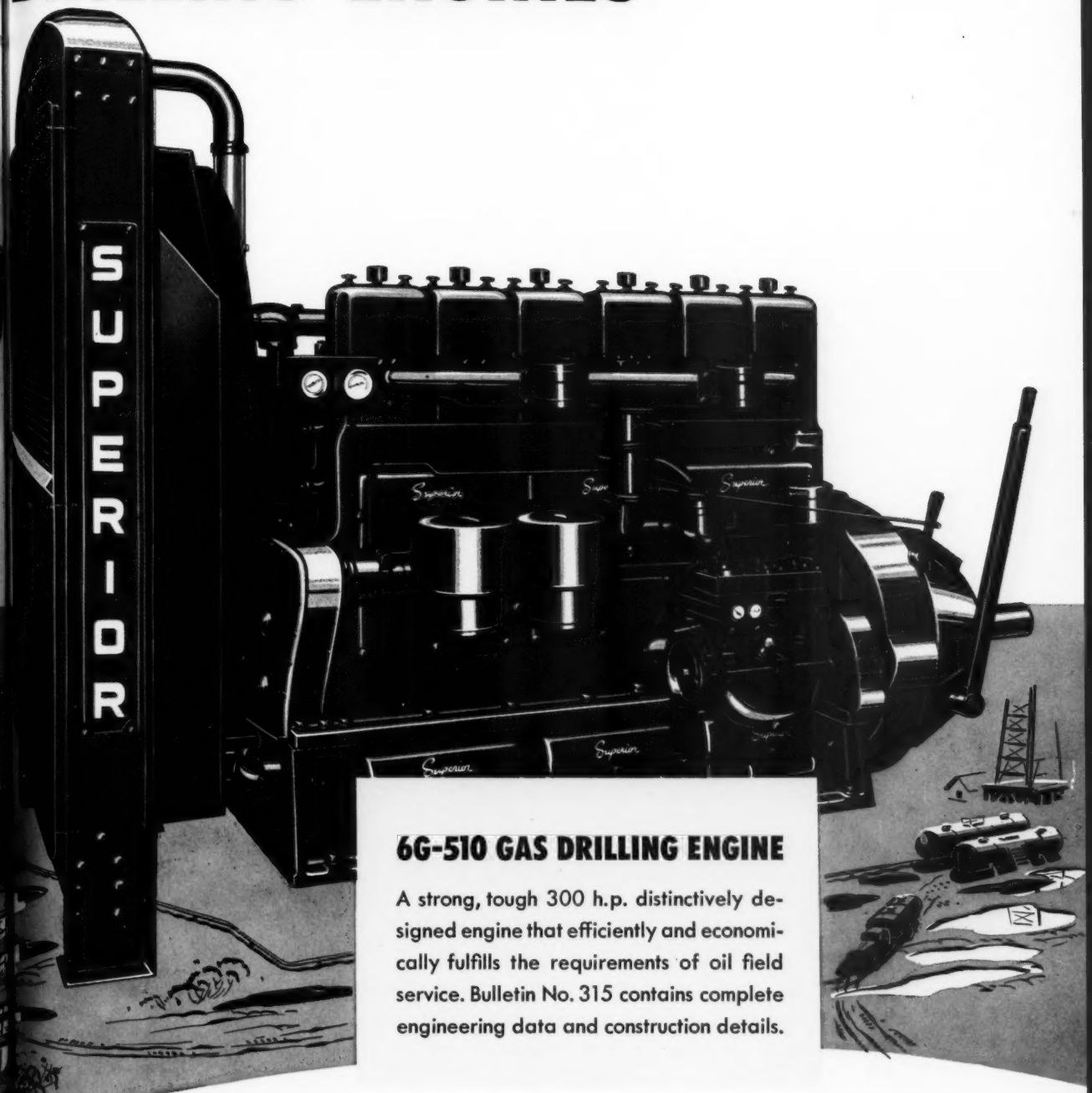

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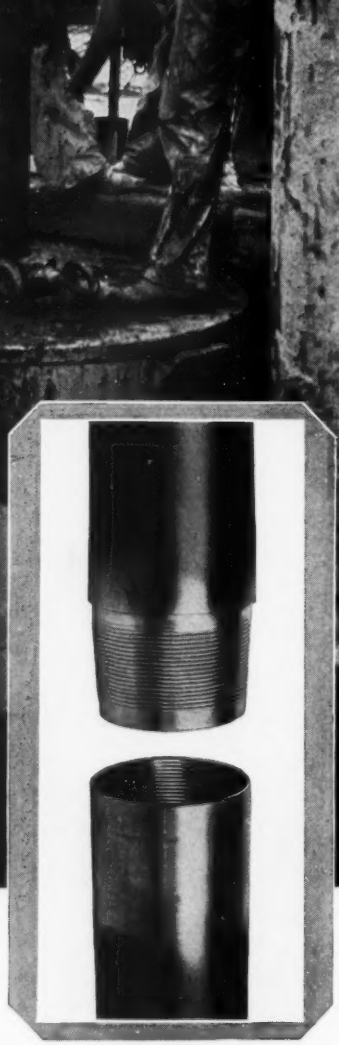

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outlet temperature may vary with tower loading adjustments are based on visual observation of the temperature on the eleventh tray. A change of 5° F. on this tray results in a change of approximately 0.5 per cent in the hexane content of the pentane concentrate.

The operation of the rerun tower is quite conventional, the separation between light and heavy gasoline being controlled by adjustment of the top vapor temperature controller which actuates the motor valve in the reflux line. The overhead product is on liquid level control. The bottoms stream is split, a portion being returned to the absorber tower on rate-of-flow and the remainder to tankage on liquid level.

Fig. 4 outlines the instrumentation on the depropanizer and debutanizer columns. Here we have two more methods of controlling temperature level. On the depropanizer column the heat input to the reboiler is held constant and the thirty-first tray temperature controls the steam input to the preheater. The depropanizer is an 8-ft. tower containing 40 plates, and it operates at a pressure of 350 psig. After it was determined that the tower spilled in the bottom section at a reboiler steam rate of 22,000 lb. per hour (which gives a vapor rate of approximately 36,000 bbl. per day), the reboiler steam rate was set at 21,000 lb. per hour and the temperature control was switched to the preheater. On the debutanizer column, the thirty-first tray temperature controls the steam input to the reboiler in the conventional manner.

It is interesting to note that each of the towers in this system employs a different method of controlling temperature level and that coil outlet temperatures, top vapor temperatures, and intermediate tray temperatures are used to control fuel gas, reflux, and live-steam rates.

Looking at the pressure controllers, again we find that no two of the towers are controlled alike. On the depropanizer and the debutanizer columns the pressure controllers actuate the regulator valves in the condenser water streams. However, in the depropanization operation it is not possible to condense all of the overhead stream and in order for the pressure controller to hold the designated pressure, it is necessary to deliver a gas stream to the fuel system on manual control. This type of control was selected as a means of suiting the water consumption on the depropanizer column to the supply in hand, and adjustments are made at rather infrequent intervals.

As a rule, the procedure followed is to satisfy the water requirements on all of the other equipment in the system and then to adjust the gas rate on the depropanizer to correspond with the quantity of water that can be supplied. The other two towers in the system employ conventional types of pressure control. The pressure controller on the prefractionator regulates the quantity of gas product recycled to the absorber tower, while on the rerun tower the reflux accumulator is open to the atmosphere. In the original design, provisions were made for repressuring the rerun tower with natural gas in order to avoid oxidation of catalytically cracked naphtha. However, it developed that this was not a problem, and it was decided to leave the accumulator open to the air.

Variable System on Material Balance Control

Returning to our discussion of control systems, Fig. 5 presents the process flow for a variable system employing material-balance control. This series of five towers processes the debutanized effluent from a hydroforming operation and, in brief, the problem at hand is to produce seven well-fractionated streams from five towers.

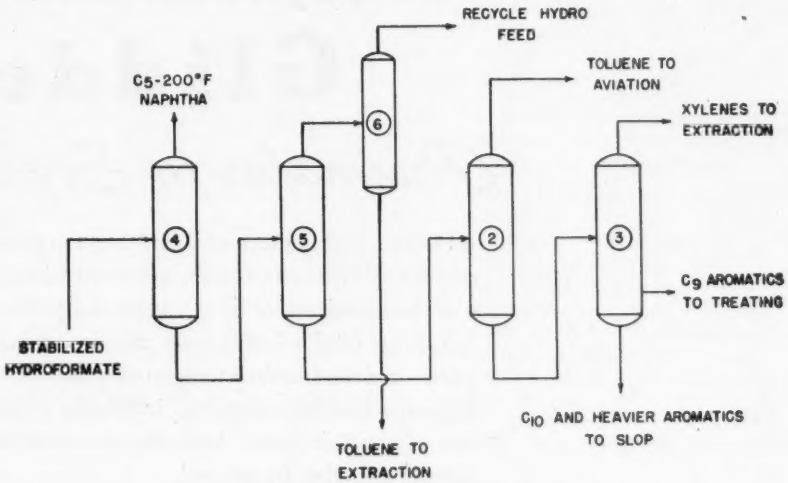

Fig. 5—Hydroformate fractionation unit—process flow

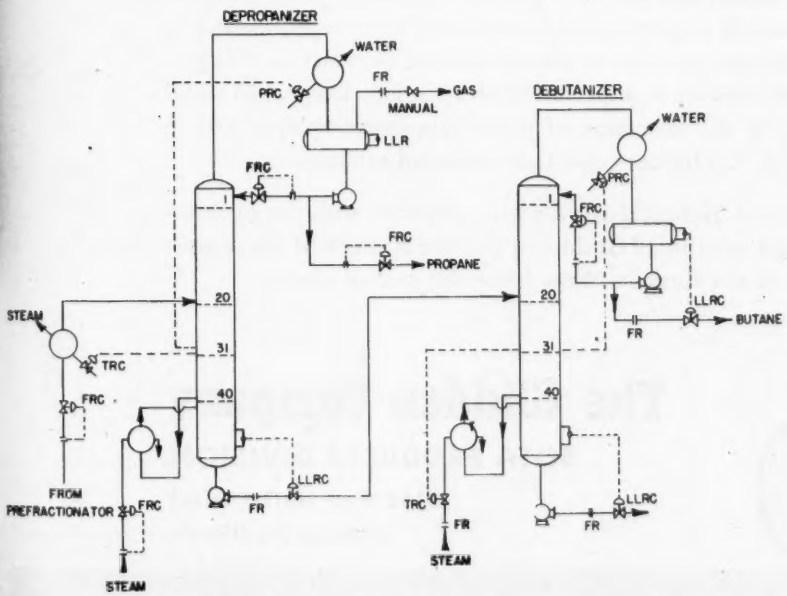

Fig. 4—Instrumentation of depropanizer and debutanizer towers—catalytic light ends unit

The process flow shown here permits the production of six of these streams, C_5-200° F. to motor gasoline, a recycle feed stream, toluene for SO_2 extraction, toluene for aviation gasoline, xylenes for SO_2 extraction, and C_9 aromatics for acid treating and rerunning. This gets a major portion of the job done. However, it has become necessary for us to recover a major portion of the C_{10} aromatics that are present in the hydroformer effluent, and herein lies the problem. Additional fractionation facilities cannot be made available at present, and it is necessary to vary the operation of the columns to permit recovery of C_{10} aromatics as a sidestream from the last tower in the series.

Fig. 6 outlines the variations in

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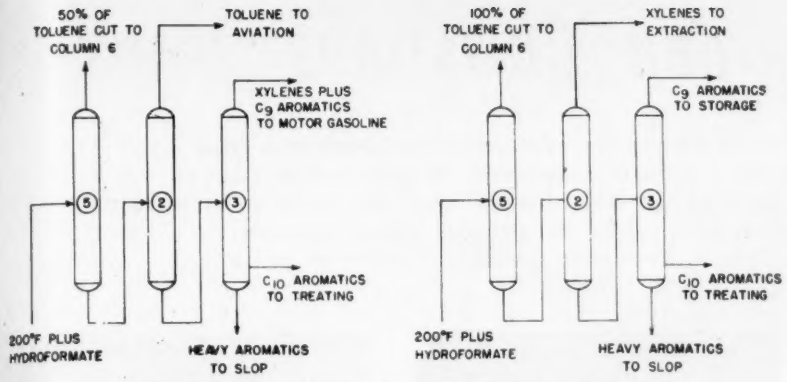
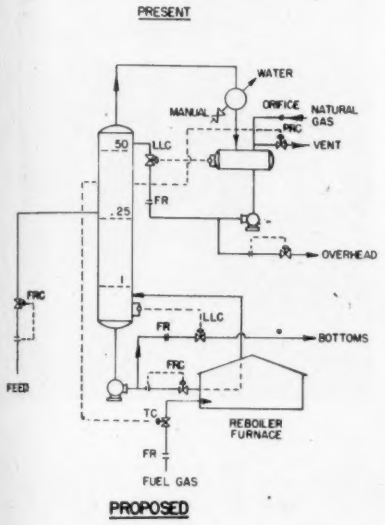

50% OF TOLUENE CUT TO COLUMN 6
TOLUENE TO AVIATION
XYLENES PLUS C9 AROMATICS TO MOTOR GASOLINE
C10 AROMATICS TO TREATING
200°F PLUS HYDROFORMATE
HEAVY AROMATICS TO SLOP
100% OF TOLUENE CUT TO COLUMN 6
XYLENES TO EXTRACTION
C9 AROMATICS TO STORAGE
C10 AROMATICS TO TREATING
200°F PLUS HYDROFORMATE
HEAVY AROMATICS TO SLOP

Fig. 6—Hydroformate fractionation unit—alternate process flows



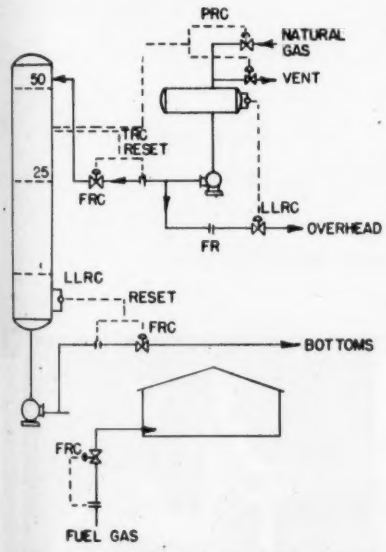


Fig. 7—Hydroformate fractionation unit—instrumentation

process flow that are commonly employed. Observe that Column 5 may take overhead 50 per cent of the toluene fraction or 100 per cent of the toluene fraction. Column 2 may take overhead a toluene fraction or a xylene fraction. Column 3 may take overhead a xylene fraction (as indicated in Fig. 5), a C_9 aromatic fraction, or a mixture of xylenes and C_9 aromatics. These three process flows are used intermittently and Columns 5, 2, and 3 swing back and forth from one service to the other giving rise to what the author terms a variable system. Now if, in addition to the change in service, we inject a rather wide variation in charge-stock composition occasioned by the processing of three distinct types of feed stock through the hydroformer, we wind up with a rather complex control problem.

With all of these variables in mind, it may be asked why a material-balance type of control was selected for this operation. Actually, it wasn't a matter of selection but a matter of doing the best we could with the existing instrument. The hydroformate fractionation towers were a portion of an Army ordnance plant designed for the production of a single product (toluene) and the pressure controllers and temperature controllers were of a design not very well suited to the fractionation problem in hand. As a result, it has been necessary to place the major product streams on rate-of-flow control and to make adjustments of rates on the basis of laboratory tests which are obtained at 4-hour intervals. On some of the towers, intermediate tray temperatures, as recorded on 0°-600° F. strip charts, are used as a preliminary guide in the course of switching from one operation to the other. As might be expected the frequent changes in feed-stock composition require numerous changes in product rates, and the lag occasioned by the time requirement for submitting and testing samples often results in the contamination of the major product streams one with the other. In the course of a year's time, this contamination adds up to an appreciable monetary loss; and accordingly, plans have been laid for revamping the instrumentation to permit operation on a temperature-control basis.

Fig. 7 details the present and proposed instrumentation for a typical column in the series. The existing hydraulic transmission-type pressure controller will be replaced by a pneumatic transmission type. A narrow range (120° F. span) resistance-thermometer type of temperature-recorder-controller will set the rate-of-flow controller on the reflux stream to maintain the desired intermediate tray temperature. Heat input to the

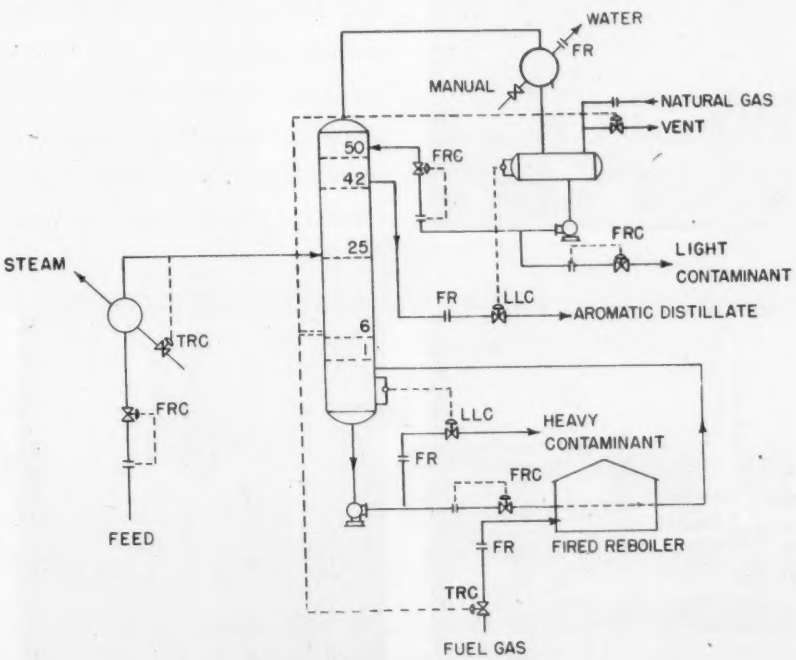


Fig. 8—Aromatics rerun unit—instrumentation

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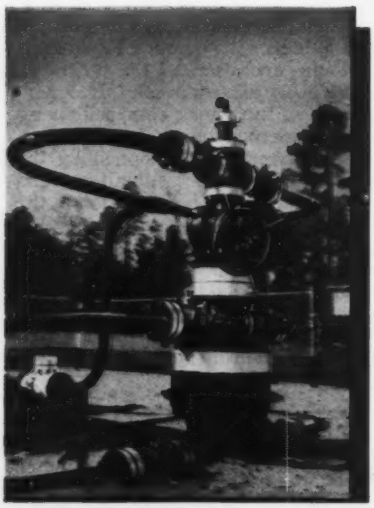

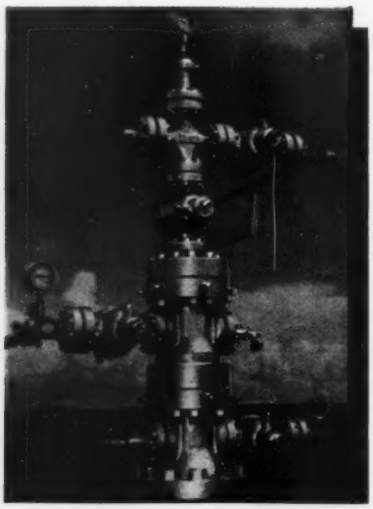

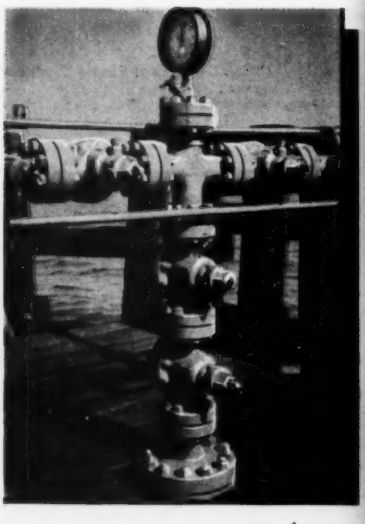

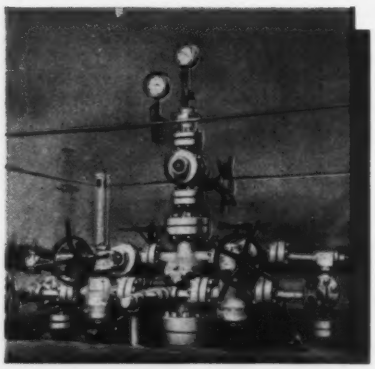

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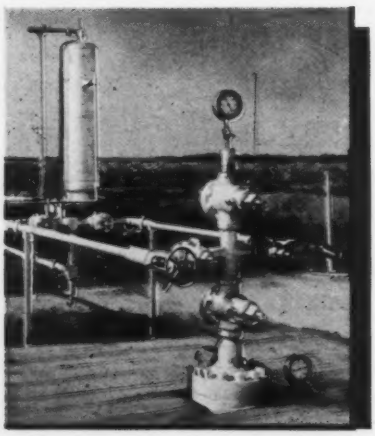

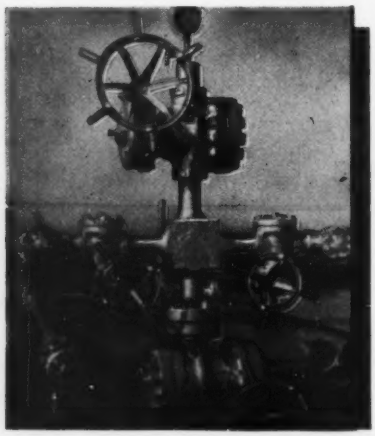

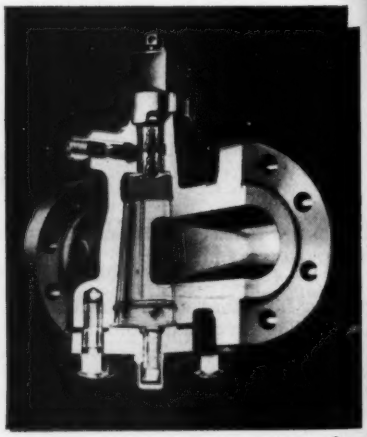

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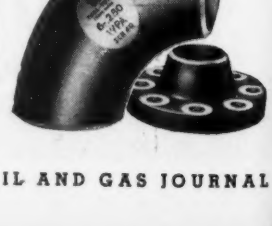

gas-fired reboiler will be on rate-of-flow control, and differential-type liquid-level-recorder controllers will vary product rates to maintain accumulator and reservoir section levels.

At such times as a product stream serves as a feed stream to the ensuing tower, the liquid level controller will set a rate-of-flow controller on the product stream. Minor benefits to be reaped from the installation of the new control system include a reduction in control-testing expense and a reduction in the wear and tear on the professional men that follow the hydroformate fractionation operation.

Variable System on Temperature Control

The remaining system to be discussed is the variable system on temperature control. Fig. 8 details the instrumentation for the rerunning of high-purity aromatic solvents. Four different feed stocks are processed (toluene, xylene, C_9 aromatics, and C_{10} aromatics). In each case the fractionation problem is the removal of such quantities of front-end and back-end contaminants as required to meet flash and boiling-range specifications on the aromatic distillate, which is removed as a sidestream from the forty-second tray of the 50-tray tower.

The front-end separation is controlled by varying the quantity of light contaminant taken overhead, while the back-end separation is controlled by a temperature controller which actuates the motor valve in the fuel gas line. In the original installation, the coil outlet temperature was used as a basis for varying the fuel gas rate. However, in the course of postwar developments which led to the processing of four grades of aromatics on the tower, it was found that the coil outlet temperature was too sensitive to variations in the quantity and quality of back-end contaminants. Accordingly, the sixth tray was selected as a point of temperature control, and a resistance-thermometer type of temperature controller was installed. At this point in the tower the tray temperatures correlate with the boiling range of the product (i.e., the quantity of heavy contaminant present), and by approaching the allowable spread in boiling range it is possible to minimize the loss of aromatics in the bottoms stream.

There are two features of this control system to which attention should be called. The first of these, which might be considered a good feature, is the flexibility which is built into the temperature controller. In order to provide a sensitivity of ±0.5° F. in the 230°-300° F. range for the toluene operation and still be able to process C_{10} aromatics boiling up to 425° F., a triple-range temperature controller was provided. This instrument has fixed ranges of 180°-300° F., 280°-400° F., and 380°-500° F. and may be changed from one range to another by merely flipping a switch.

The other feature, which might be considered a bad one, is the time lag that is built into the system. It will be noted that the two streams leaving the reflux accumulator are on rate-of-flow control, and the accumulator liquid level controls the withdrawal rate on the sidestream product. In the event of a loss in accumulator level, the level controller reduces the withdrawal of sidestream product. This in turn tends to reduce the sixth tray temperature and brings about an increase in firing rate which ultimately restores the reflux accumulator level. Despite a time lag of 10-15 minutes this arrangement permits satisfactory control of liquid level and affords a near constant degree of fractionation between the light contaminant and the prime product.

This is the first of a two-part article. Part 2 will be published in next week's issue.

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Fig. 1—Roadrunner en route to location. The unit is a complete package and is driven between locations with all blocks strung and guys attached

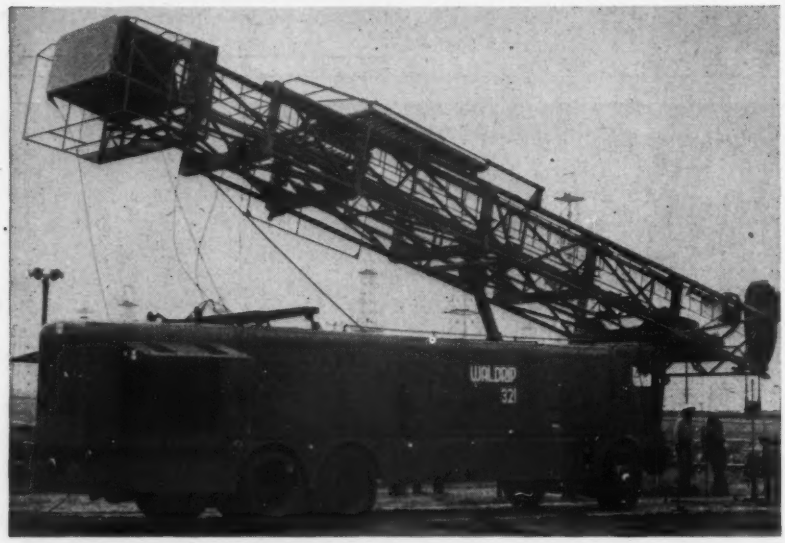

Fig. 2—At location the unit is driven into the correct spot instead of being backed in. In this photograph, the derrick is just starting to elevate

Self-Propelled Service Derrick

Embodies Many Unusual Features

by Herndon David

A NEW self-propelled servicing unit recently introduced to the petroleum industry not only employs for the first time many features necessary to simplify the task of servicing oil wells but also may be provided with the rotary attachments necessary for drilling wells up to 4,000 ft. in depth. Designed from the ground up by Waldrip Engineering Co. of Hollydale, Calif., and designated as the Roadrunner, the unit incorporates a number of interesting and unusual features.

One advantage of the self-propelled rig is the fact that it may be driven directly into and spotted exactly on the location, without backing in or maneuvering. Over the period of several jobs this can result in considerable saving. Secondly, the unit is equipped with a torque converter which not only drives the hoist at desired line speeds and pull but also provides the vehicle with a fluid drive. In road tests, the vehicle has been driven over extremely rugged and mountainous terrain without gears ever being shifted. Other advantages are excellent weight and balance with less load on the front wheels; positioning of controls with full operating vision; positioning of motor for accessibility; paneled construction to facilitate cleaning, and light weight necessary to conform to highway regulations.

Telescoping Derrick

The portable derrick supplied as an integral part of the new unit is of the two-piece telescoping type, of tubular construction and hydraulically erected by power. The unit may be equipped with any one of three different derricks. Two of the types are 65-ft. extended-height derricks with hook-load capacities of 60,000 and 90,000 lb. Both of these derricks have a clearance of 62 ft. from the ground to the bottom of the crown when extended, and telescope into a 41-ft. package. They are equipped with only two guy wires secured to the rear of the vehicle. Safety factors with the two guys, however, exceed two.

The third derrick which may be used with the unit is a 90-ft. extended-height derrick with a hook-load capacity of 120,000 lb. This derrick provides 88-ft. clearance from the bottom of the crown to the ground and is telescoped into a 47-ft. length. Two load-carrying guys are used at the back anchored either to the vehicle or to deadmen immediately in back of the derrick, and two stabilizing guys are used forward and to the side to points approximately 12 ft. from the center line of the well. All derricks are provided with a leveling screw and socket plate in each leg.

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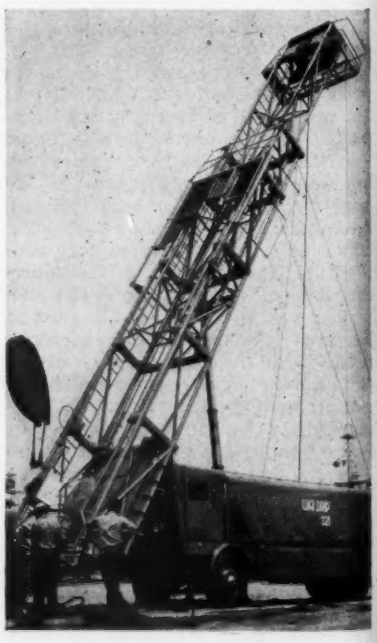

Fig. 3—As the derrick continues to elevate, the upper section begins to extend, thus making a simultaneous operation of extending and elevating through operation of a single control

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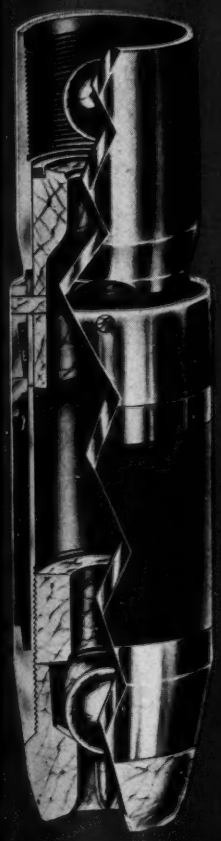

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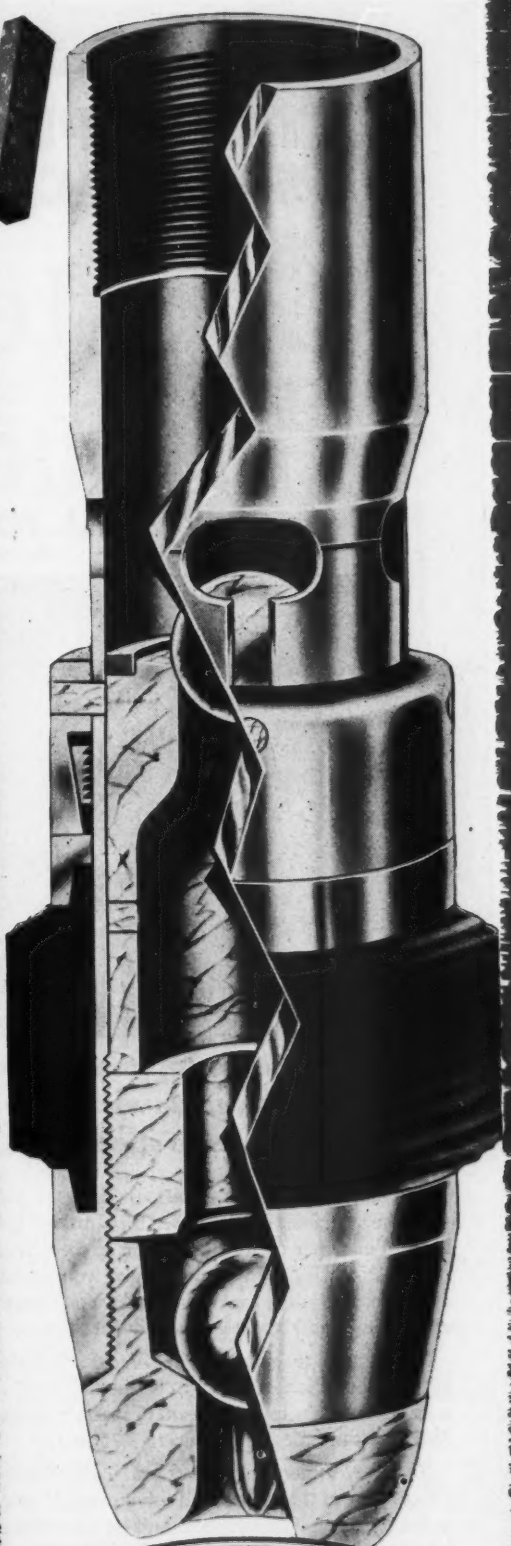

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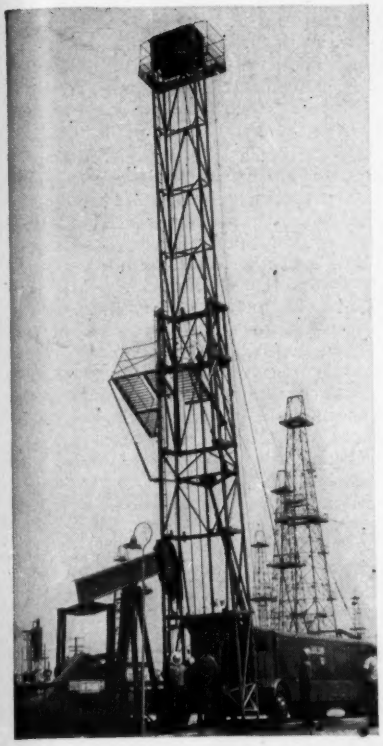

Fig. 4—When the derrick is fully elevated and extended, the tubing platform automatically lowers without further operation of controls

quately guarded to prevent the line from leaving the sheave.

The derrick is erected in less than 4 minutes and is accomplished on the part of the operator merely by engaging a four-way valve. The derrick raises, extends and lowers the tubing platform simultaneously through operation of the one control. The raising and extending mechanism consists of a hydraulic cylinder and wire-line arrangement. As the derrick is raised by the hydraulic cylinder, the wire lines simultaneously extend the upper section. The force required for extending the derrick also applies a load to the hydraulic cylinder, preventing the derrick from falling away from the cylinder when it goes over center. Also, the cylinder must be filled before the derrick can be lowered. The derrick can be raised or lowered only under power, and a safety-catch mechanism is incorporated into the extending device which makes it impossible to drop the upper section.

A semiautomatic derrick lock locks the two sections together in every direction. This lock requires no assistance from the ground as it swings into position automatically.

The tubing platform, which lowers automatically when the derrick is raised, is adjustable and provides racking capacity for 6,000 ft. of 2½-in. tubing or 4,000 ft. of 3½-in. drill pipe.

Fig. 6—Tubing platform of the Roadrunner has large racking capacity, capable of holding either 6,000 ft. of 2½-in. tubing or 4,000 ft. of 3½-in. drill pipe

Design of Hoist

The hoist of the Waldrip unit consists of a main drum and a sand reel. The main drum has two friction clutches, one built into each end of the drum and each driven by a different ratio so that a high-low speed shift instantaneously is obtained without a gear change. The sand reel is driven by a single friction clutch.

The general design of the drums includes such features as built-in type air-friction clutches, completely enclosed; water-cooled brakes; alloy-steel removable brake rims; grooved drum-barrel jackets and self-aligning, antifriction bearing mountings, with single-point lubrication completely outside the drum.

The drums themselves are built without drumshafts in order to conserve weight. They rotate instead on a pair of trunnions at the end of the drum. The drums also are designed so that they may be engaged to a clutch drive hub by means of bolts in case of air failure.

Both the main drum and sand reel are driven from two stub countershafts located on each side of a right-angle gear box between the two drums. These countershafts are mounted upon antifriction bearings, centrally lubricated. The right-angle gear box is used to drive the countershaft from the output shaft of the transmission or torque converter. It consists of a pinion driving a ring gear which is clutched to a through shaft located at right angles to the pinion. Engagement of the ring gear rotates the countershaft and consequently drives the hoist. A second pinion located in the after part of the box is also driven by the ring gear. This pinion in turn drives the vehicle over the road by means of a transfer case and also drives the rotary table when one is used. All of the drives may be operated separately.

The entire hoist is completely guarded with easily removable, lightweight guards, and splash guards with an angle drain are provided around the drums. The brakes also

mounted on ball bearings and a tubular alloy shaft are provided. All are mounted on the same shaft, lubricated from a central point, and ade-

Fig. 5—Power controls for every operation are conveniently located at the derrick leg. Such location gives perfect vision of the derrick, tubing platform, and of the well head or rotary table

are completely enclosed and protected.

Auxiliary Transmission

For driving the vehicle over the road and to furnish a reverse to the hoist and rotary-table drive, a two-speed - forward, one - speed - reverse transmission is provided. This transmission is fastened to and forms an integral part of the torque converter. It gives a broader range of speed and pulling power to the truck and also provides a reverse.

The vehicle in addition is equipped with a torque converter which, when used with a two-speed shift, gives ample speed and power to drive the vehicle over the road at speeds up to 25 m.p.h. and to drive the hoist at desired line speeds and pull.

Engines and Controls

Engines to power the vehicle and hoist may be either gas, gasoline, butane, or diesel, according to the desires of individual operators. Power controls for every operation are remotely located at the derrick leg in such a way as to be usable for both drilling and servicing. This location gives perfect vision of the derrick, tubing platform, and of the well head or rotary table. All are finger-tip controls and are a combination of hydraulic and air control systems in one lever, thus allowing the advantages of each system to be utilized. The engine throttle control is a closed, no-pressure hydraulic system with instant response and a vibrationproof lock which prevents "fadeoff" and "pick-up" in engine r.p.m. without the throttle being moved.

The direct-acting air clutches are controlled by valves which permit cushioned engagement at any speed or pull, plus instantaneous shifting from high to low. The air clutches themselves are inherently unable to grab, are completely impact proof, and require no adjusting at any time.

Controls provided are as follows:

Throttle.—Waldrip frictionless foot throttle in vehicle cab. Ellinwood hydraulic hand throttle combined with Westinghouse air clutch control on a single handle at derrick leg.

Engine clutch.—Westinghouse air engine clutch control.

Main drum clutches.—Balanced valve direct air control on same handle as throttle control.

Main drum brake. — Waldrip hydraulic control, mechanical emergency.

Sand-reel brake.—Waldrip mechanical control.

Main right-angle gear-box shift.—Mechanical.

Two-speed transmission shift.—Mechanical.

Derrick-raising control.—Hydraulic.

Instrument panel. — Includes: engine speedometer, engine temperature, oil and air pressure, hydraulic pressure, torque converter pressure, torque converter temperature, and an ammeter.

Rotary Equipment

As previously mentioned, the Roadrunner may be provided with rotary equipment for the drilling of wells up to 4,000 ft. in depth. When such use is desired a second right-angle gear box is located aft of the hoist between the frame members. By driving straight through this box the rotary table is driven by means of a propeller shaft and airflex clutch. By driving at right angles through the box a rear-end rotary countershaft is driven, thus providing all the accessories necessary for rotary drilling.

The rear-end rotary countershaft, located as explained above, is driven by chain drive from the rotary-drive gear box. This gear box has a net horsepower capacity of 150 hp. for the right-angle drive.

The self-propelled unit also may be equipped with a reeving shaft located immediately behind the derrick hinge point. This shaft directs the main drum pulling line up the inside of a conventional derrick when it is desirable to drive the unit under such a derrick previously left standing.

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CLEANING TUBULAR HEAT EXCHANGERS

by P. F. Dougherty and C. H. Brooks

This article covers various methods available for cleaning tubular heat-transfer equipment, with particular emphasis on the use of an emulsifying oil for "in-place" cleaning, and on the use of sandblasting. The relative merit of the in-place and the mechanical methods are outlined, as well as factors to be considered in selecting a particular procedure for a given application. The authors are in the engineering division, manufacturing department, Sun Oil Co., Philadelphia. Paper given at annual A.S.M.E. meeting, New York, November 29.

THE cleaning methods for tubular heat-transfer equipment fall into two general classes. The first class consists of those methods which perform the cleaning without dismantling the equipment, by means of the circulation of a solution which chemically and/or physically removes the fouling material. The second class includes all those methods where the equipment is partially or wholly dismantled, and the fouling agent removed by a purely mechanical means.

The adaptability of the in-place methods must be determined by physical and chemical examination of the fouling substance. Laboratory solubility tests must also be made of the material. A plant-scale test under close supervision should then be made, if it be found in the laboratory that a significant portion of the fouling material be soluble (see below).

If no suitable method is found for cleaning in place, one of the various mechanical methods must be used. The selection here will be determined by the nature of the deposit and extent of the deposit as well as other factors which will be discussed later in the paper.

It is obvious that the efficiency of cleaning and the frequency with which it must be performed, can only be determined by periodic heat-transfer surveys. In many cases, however, it should be possible to establish certain criteria which may be used by the operators, without the necessity of performing a complete survey.

Cleaning in Place

In order that equipment may be cleaned in place the fouling material must be capable of removal by one of the following methods:

1. Chemical reaction with, and subsequent solution in, an acidic or alkaline solution.

2. Solution of a portion of the fouling material (i.e., a binder) in the cleaning fluid, thus permitting the undissolved portion to be flushed out. The cleaning fluid may be hot or cold water or acidic or alkaline solutions. The flushing agent may be the cleaning fluid used or another liquid or emulsifying oil.

3. Suspension of the fouling agent in the cleaning fluid.

4. Complete solution of the fouling agent or of the binder in an organic solvent.

5. Combinations of the above methods.

Our experience indicates that cleaning in place has the following advantages:

1. Down time for equipment is reduced.

2. Dismantling of equipment with resultant damage and high labor cost, is avoided. In those cases where tube bundles cannot be removed, no other methods are available for cleaning the shell side.

3. Cleaning is more thorough. The solution will clean parts which would be difficult or impossible to reach with cleaning tools.

4. Cleaning is more uniform. There are no small particles of scale remaining on the surface. On the contrary, mechanical cleaning usually leaves small particles of scale on the surface, which act as nuclei for the rapid formation of new scale.

5. There is practically no loss of metal.

6. The metal surface is left smooth in contrast to mechanical cleaning which frequently results in scoring which provides a place for lodgment of fouling material.

As pointed out above, laboratory tests should be made to determine the feasibility of the use of a particular in-place method. This work should be followed by closely supervised plant-scale tests to confirm the laboratory results and to develop the actual procedure to be followed, if the method be adopted.

Our experience has indicated that the normal procedure of steaming the equipment for extended periods prior to cleaning, should not as a rule be followed when cleaning in place is planned. In one case it was found that the tubes appeared almost clean when the equipment was opened without steaming, whereas they were almost completely plugged with a rubbery mass, after steaming for several hours. Prolonged steaming in mast instances results in the removal of the more volatile components of the fouling material and the production of a residuum which is far less soluble than the original fouling substances.

Prior to the adoption of an in-place method of cleaning a particular piece of tabular equipment, investigation should be made to determine if:

1. There be evidence of severe corrosion or deep pitting. The removal of the scale may uncover actual perforations in the tubes, which are plugged with scale.

2. In the course of normal service, any portion of the tubes becomes plugged completely. If such be the case, the equipment must be opened and the tubes unplugged prior to in-place cleaning. Otherwise, the solution will be unable to contact with the fouling material, and the equipment will not be thoroughly cleaned.

Solution Cleaning

The use of inhibited acid has been described and discussed at length previously. We have found that the use of this technique is most advantageous on the water side of coolers. It should be noted that in at least one instance the fouling material was only partly soluble in the acid. The solution of this portion, apparently acting as a binder, permitted the remainder to be flushed out by the circulation of the acidic solution.

Solution of scale binder.—The basis of this method of cleaning is the solution of sufficient of the fouling material to loosen the remainder, at the same time that a sufficiently high circulation rate is maintained so that the loosened material is mechanically carried out of the equipment. In many cases it is advantageous to intersperse a boiling of the solution, by steam applied to the other side of the tubes, as well as to reverse the flow of circulating medium.

An alkaline solution was used to clean certain exchangers in a solvent refining unit, with the result shown in Table 1. An abnormally high circulation rate is believed to have assisted the cleaning in this case. In addition no steaming was used prior to cleaning (see above).

A second example of the efficacy of dissolving a binder in the fouling material is given by a set of gas oil-crude exchangers in a catalytic cracking unit, which were fouling rapidly on the crude side. Steaming out had proved unsatisfactory to remove the fouling material which was approximately 70 per cent salt, with remainder insoluble organic and inorganic material. Circulation of boiling

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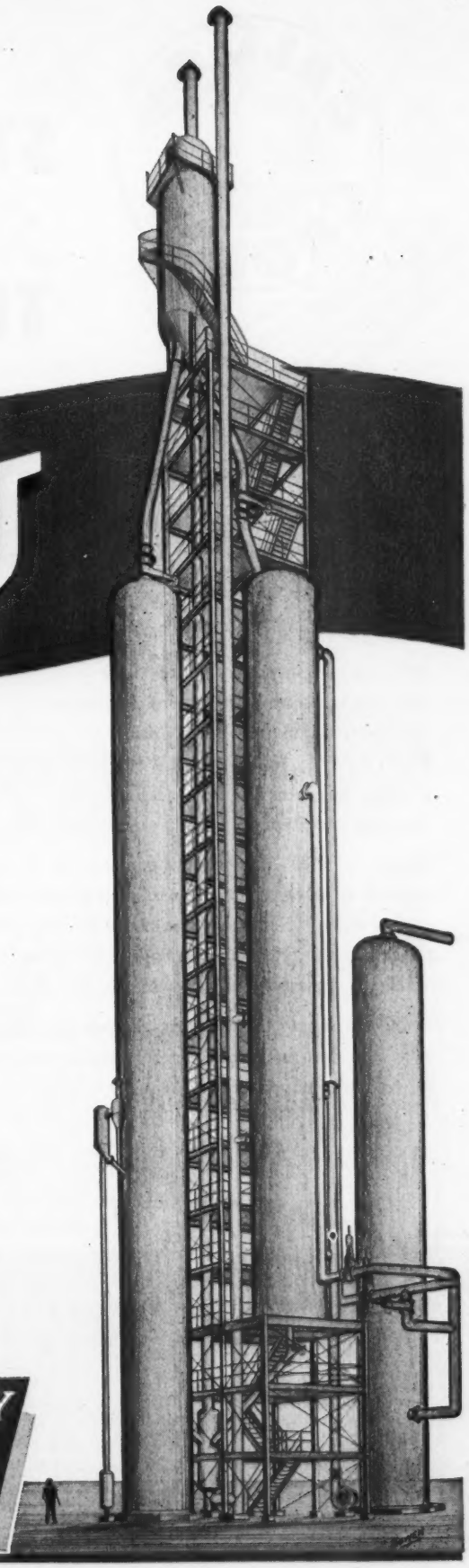

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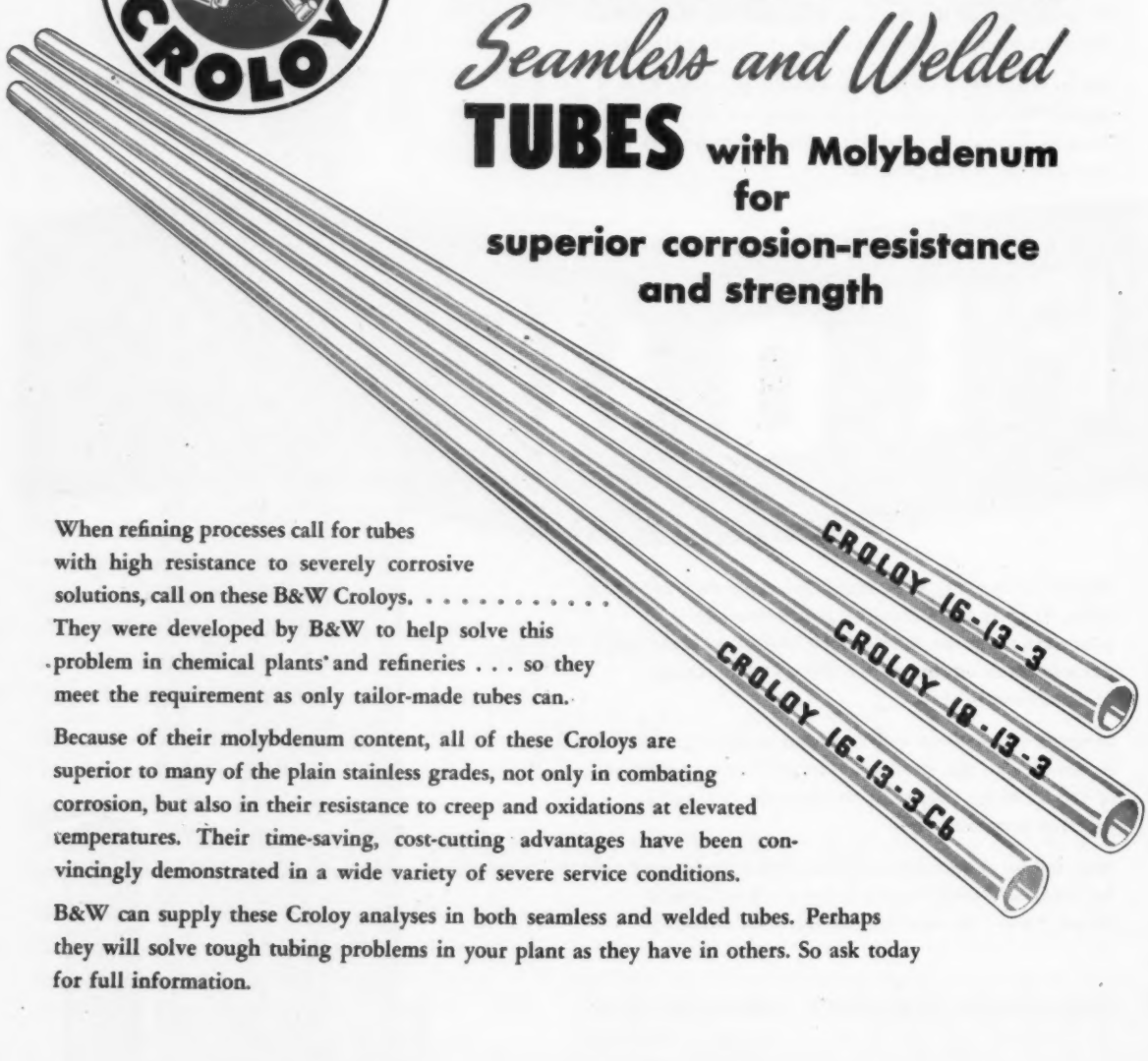

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TABLE 1

Example—	Solvent refining unit exchrs. A	Gas oil crude exchrs. B	Abs. oil exchrs. C	Gasoline feed-btms. exchrs. D
Cold end temp. difference, °F.:				
Before cleaning	185	....	46	40
After cleaning	146	....	2	12
Design	....	....	5	30
Hot end temp. difference, °F.:				
Before cleaning	155	....	115	91
After cleaning	94	....	91	75
Design	....	....	38	35
Over-all coefficient B.t.u./H.12/Ft.²/°F.:				
Before cleaning	13.5	16	7.2	36.4
After cleaning	37.0	46	30.2	51.1
Design	42.5	....	35	60
Pressure drop, psi.:				
Before cleaning	....	....	....	90
After cleaning	....	....	....	20

water at a very low rate produced the results shown in Table 1.

Cleaning With Emulsifying Oil

The use of an emulsifying oil, available in our refinery, is applicable where the fouling material is (a) completely soluble in the oil or (b) can be held in suspension in the oil, and thus removed from the equipment.

This method was primarily developed for the cleaning of the oil (shell) side of absorption oil coolers. The fouling material was an emulsion with a grease-like consistency, composed of water, oil, resins, and inorganic solids. The use of heat or solvents broke this emulsion, allowing the resins and inorganic solids to settle out behind the baffles where they could not be removed by flushing with water or high or low-viscosity oils. Experience indicated that the presence of these solids accelerated the formation of the emulsion after cleaning. Hence a method to remove both the emulsion and the solids was required. Experiment indicated that mixing concentrated emulsifying oil (i.e., without dilution with water) with the fouling emulsion and then heating to obtain the desired fluidity, would permit these objective to be attained.

After isolation of the equipment, the oil (shell) side was filled with emulsifying oil. The oil was heated to approximately 150° F. and circulated until there was no change in the appearance of material entering the circulating tank. Circulation was then stopped and the contents of the shell heated until a pressure of 50 psig. was reached. The contents of the shell were then blown through the drain valve into the circulating tank. After washing with water, the unit was drained and returned to service. The improvement is indicated in Table 1.

Substantially the same procedure was followed in cleaning the feed-bottoms exchangers on a light gasoline distillation tower, with the result shown in Table 1.

When the various in-place methods prove to be inadequate resort must be made to the mechanical methods which include (1) lancing with air, steam or water; (2) drilling or "rodding" the obstructive material from the tubes; or (3) sandblasting.

All of the above methods require that the exchanger be at least partially dismantled for cleaning, as distinct from the in-place methods, where any dismantling is only for inspection purposes.

The selection of the method depends on the nature of the following material. It should be noted that it is decidedly advantageous to steam both the tube and shell sides for as long as time will permit, prior to mechanical cleaning. This steaming removes the tarry or oily components of the fouling material, thus increas-

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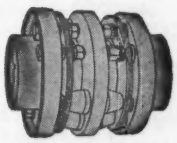
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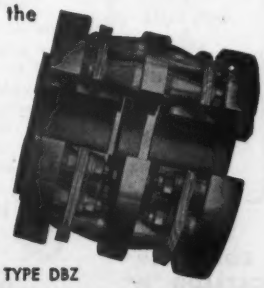
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ing the effectiveness of a given cleaning method.

The discussion below is confined to cleaning the tube side of the tubular heat exchangers.

Lancing.—This general method employs a relatively small high-velocity jet of steam or air and occasionally water. It is applicable only when (a) a low percentage of the tubes are completely plugged, (b) the fouling material is not tightly bound to the tubes, and (c) the fouling agent is not of a gummy or tarry nature.

Drilling and rodding.—Drilling and rodding consist of forcing a closely fitting rotating drill or a closely fitting rod through the tube. These methods are used when (a) a high percentage of the tubes are completely plugged, (b) preliminary steaming leaves considerable tarry or gummy material in the tubes, or (c) if the fouling material is tightly bound to the tubes (drilling only).

These two methods have certain serious disadvantages which are common to any method, e.g., wire brushing, which in essence scrapes the fouling material from the surface. These disadvantages include (a) excessive down time and labor costs; (b) frequently a necessity for removing the tube bundle before it can be cleaned; (c) metal loss as a result of cleaning is excessive and/or unevenly distributed. Scoring of the tubes, which sometimes occurs, seems to accelerate the fouling rate; (d) small amounts of the fouling agent are left on the tube surface, which act as nuclei for the rapid buildup of the fouling agent.

Sandblasting

Sand blasting can be used to clean the inside of either steel or admiralty tubes when the fouling material is not removable by any of the previously discussed methods. Such fouling material is, in most cases, composed of mixtures of tars, resins, inorganic solids, and carbon. Its physical and chemical nature is such that an insufficient amount will dissolve in any of the solvents or solutions outlined above to permit the scale to be removed.

The procedure which has been followed successfully, with no measurable metal loss, is as follows:

1. After isolation and draining of the exchanger, it is steamed for at least 6 hours, and longer if possible, to vaporize, or solidify any oily, tarry, or gummy materials. Otherwise, the sand will tend to stick to the surface, thus reducing its effectiveness.

2. The exchanger is opened, and any plugged or partially plugged tubes are opened by lancing, drilling, or rodding. To effectively use the sandblast an opening through the entire tube length, large enough to allow free passage of sand, is required. In general, the harder or more brittle the scale, the smaller may be the opening.

3. Sandblast the tubes. It has been found that ordinary labor, with reasonable care, can satisfactorily perform this operation without special equipment.

4. Excess sand is blown from the tubes, the tubes inspected, and the unit closed and returned to service.

It should be emphasized that we have not found a measurable metal loss in a sandblasted tube. Sandblasted tubes have been removed from bundles, split longitudinally and found to have a wall thickness over their entire length which was within normal manufacturing tolerances.

It is our opinion that the heat transfer in a sandblasted tube equals that for a new tube. In addition, qualitative, and scanty quantitative data indicate very definitely that, in many cases, the fouling rate is less for a sandblasted tube than for one cleaned by more conventional mechanical methods. This is believed to be due to the perfectly clean surface which is produced.

In our opinion, sandblasting as a supplementary procedure should be considered when rodding, drilling, etc., are the primary cleaning methods required.

Note.—The use of emulsifying oil as a cleaning agent for tubular equipment is covered by an application for United States letters patent.

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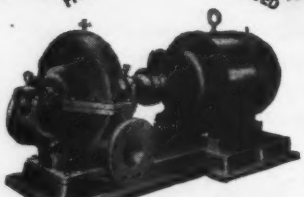

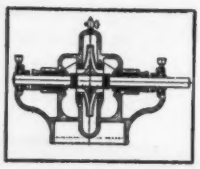

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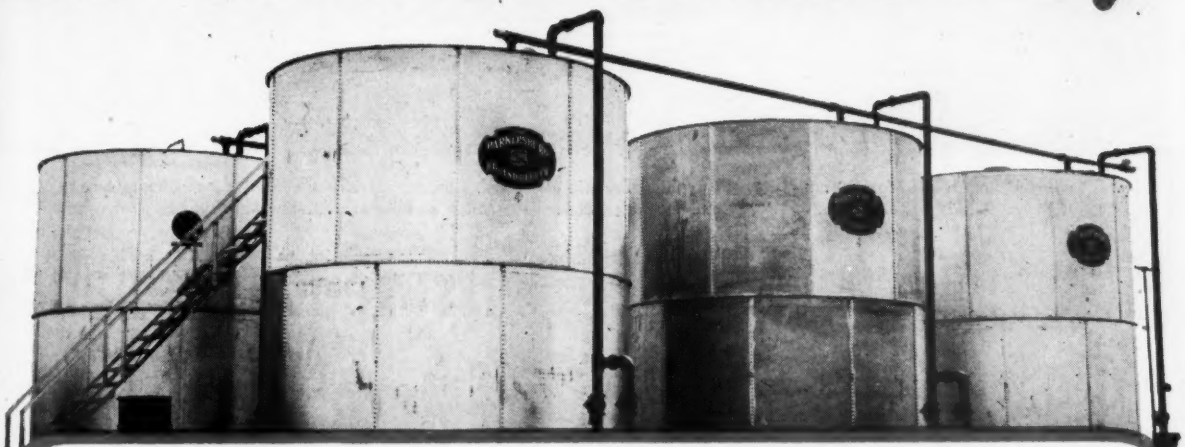

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Secret of its success is a new type synthetic rubber which acts as a *permanent, non-extractible* plasticizer for the resin base materials. That means long-lasting flexibility—excellent adhesion—high corrosion resistance—resistance to thermal shock.

CORO-GARD SPECIFICATIONS

Color:	Coro-Gard 817—gray; Coro-Gard 942—black.
Base:	A combination of synthetic resin and synthetic rubber.
Solvent:	Methyl isobutyl ketone and butyl acetate
Viscosity:	18-26 sec. at 80°F on Ford Cup (¼" orifice) Viscosimeter
Solids Content:	30% by weight, prox., or 2.4 lbs. per gallon
New weight:	8.0 lbs. per gallon, prox.
Coverage:	(wet coat) 250 sq. ft. per gallon, prox.

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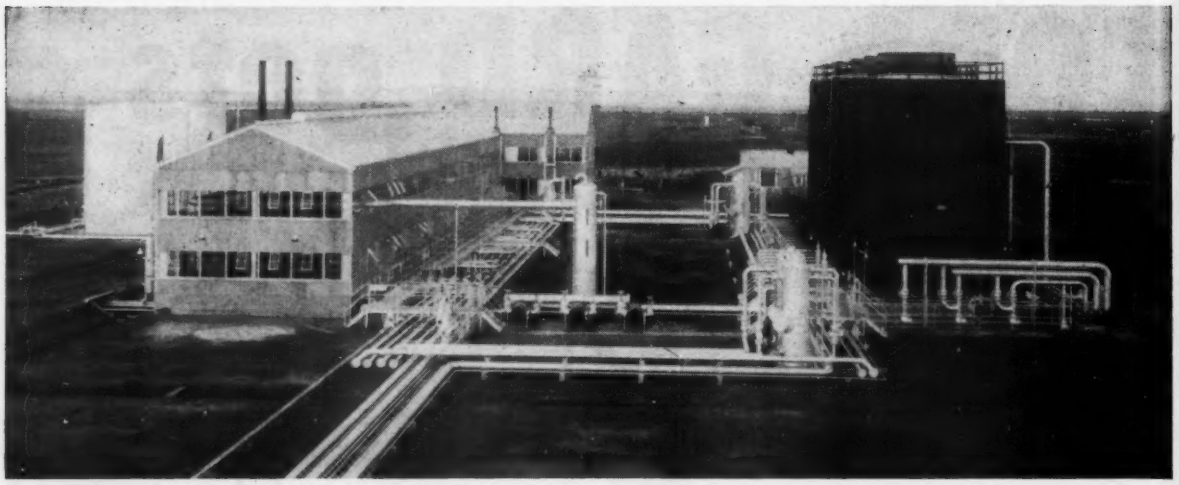


At left is main building of the Mene Grande pressure-maintenance plant at West Guara—housing compression capacity to handle 28,000,000 cu. ft. daily of 1,800-psi. gas. Also shown is gasoline stabilization equipment and forced-draft cooling tower

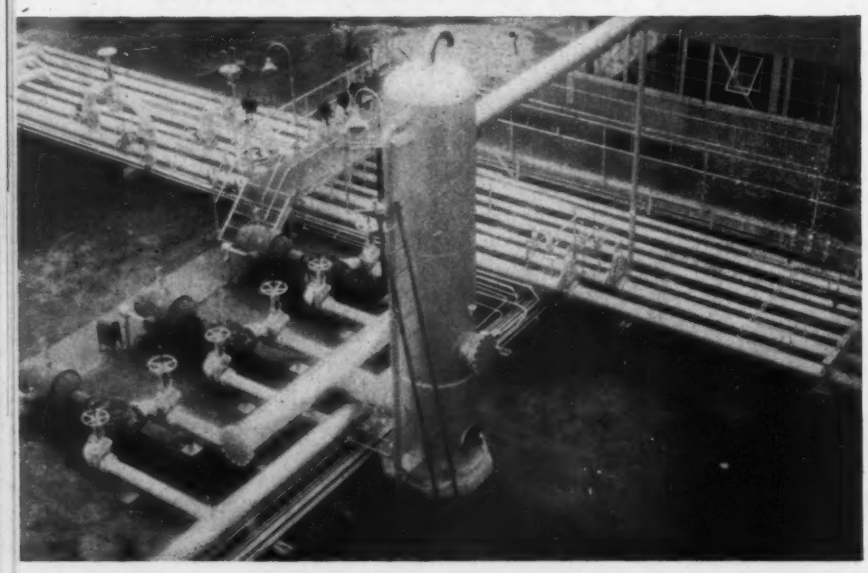
Mene Grande Installs Pressure-Maintenance Plant in West Guara, Eastern Venezuela

by K. B. Barnes and D. H. Stormont

A NEW pressure-maintenance plant recently has been placed in operation in Eastern Venezuela by Mene Grande Oil Co. which marks a significant trend in the conservation of the oil and gas resources of that country. The operation—in West Guara field—will increase the ultimate oil recovery, maintain efficient production rates at a high level, and prolong the flowing life of the wells. Design and equipment procurement work for the new plant was carried steadily forward from 1945. Machinery and supplies began to arrive on the location in the spring of 1947.

Of interest to engineering and operating personnel are the advances in modern petroleum engineering practices being used in foreign installations. The two Oil and Gas Journal engineering authors of this article visited the new Mene Grande pressure-maintenance plant described here, both when it was under construction, and after placement in initial operation.

Top-side view of engine jacket-water surge tank and pumping equipment with compressor manifold in background

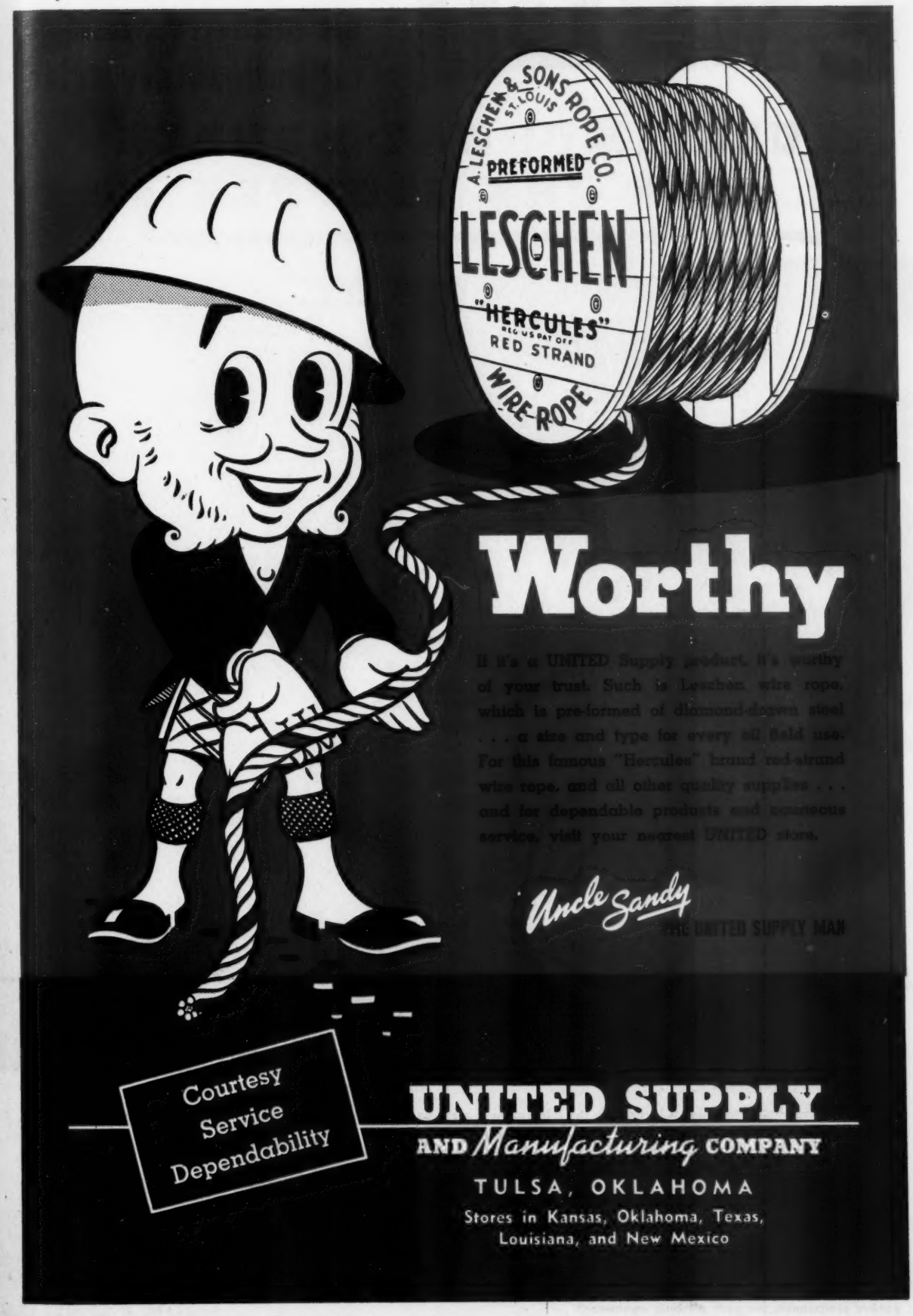


The field is in the State of Anzoategui in Eastern Venezuela and only some 6 miles distant from Meneg's big division headquarters and camp at San Tome. About 1 year later the construction was virtually complete and the compressors were ready to do their job of injecting high-pressure gas into the gas-cap areas of four reservoirs (more may be so operated later), and squeeze out additional oil over that normally recoverable.

Mene Grande's West Guara pressure-maintenance plant has a gas capacity of 28,000,000 cu. ft. daily. It was designed by Bechtel International, Ltd., of San Francisco and Caracas, with the cooperation and assistance of Mene Grande, and the actual plant construction also was carried out by Bechtel, supervised by Mene Grande.

This new pressure - maintenance plant can be treated as to the following divisions: (1) gas gathering and injection, (2) compressors, (3) natural-gasoline extraction, and (4) utilities and auxiliaries. The relation of the West Guara plant to the underground oil reservoirs and producing conditions also will be discussed.

The 8 to 12-in. gas-gathering lines (total 6.2 miles) from the field traps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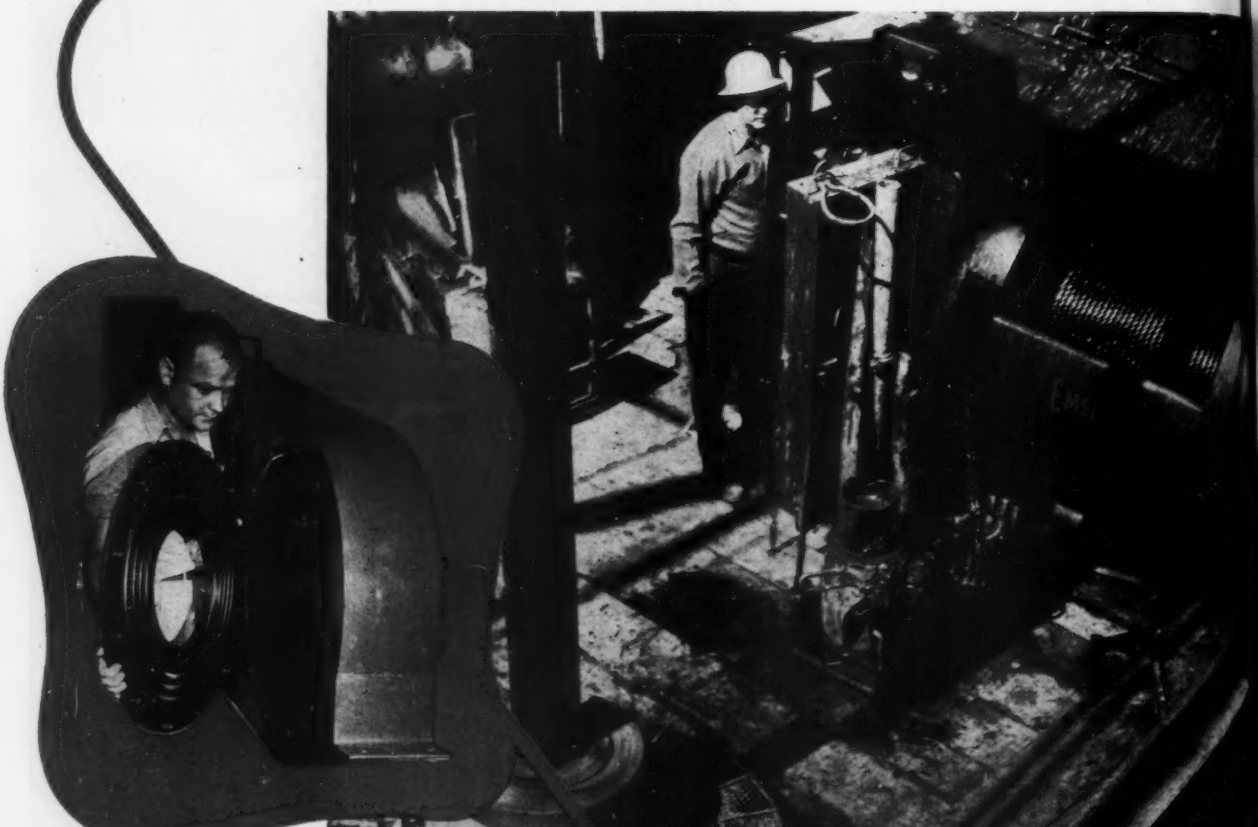
USES MURRAY RUBBER FOR THE STOPPER



Since rotary chain life depends largely on the lubrication it receives, drawworks and chain manufacturers alike have worked long and hard on this problem. EMSCO . . . the first and only drawworks manufacturer to date with an oil-bath rotary drive . . . solved the problem with the help of Murray Rubber. A molded rubber "stopper" (see illustration) provides a seal around the chain sprocket and drive shaft. Bellows in the rubber seal allow it to take rig vibration without wear or strain.

With the facilities of the largest, most modern and complete mechanical rubber manufacturing plant in the South and a staff of skilled engineers, Murray can help you develop new, or improve your present, rubber components for your oil field equipment.

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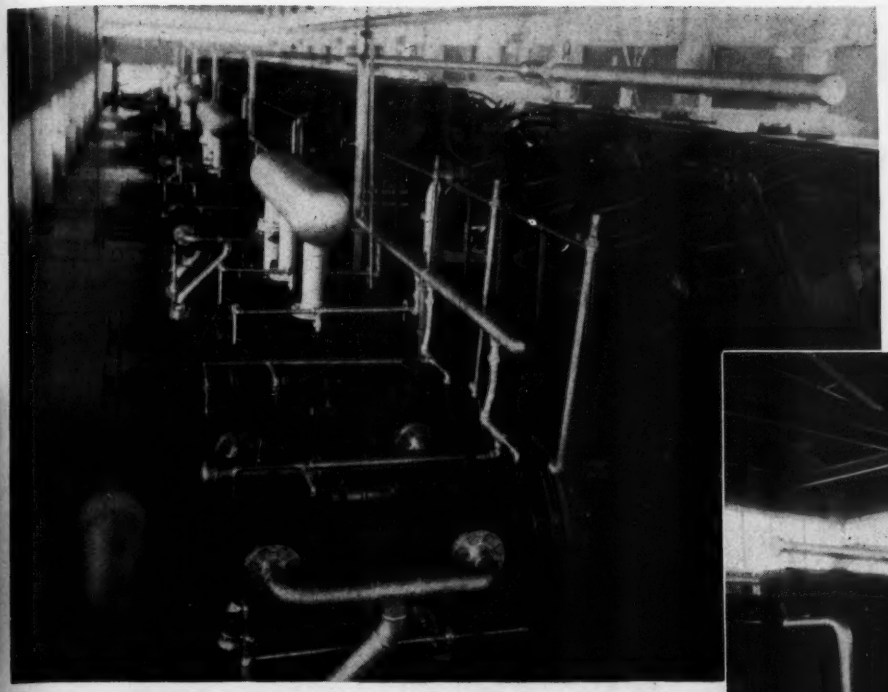
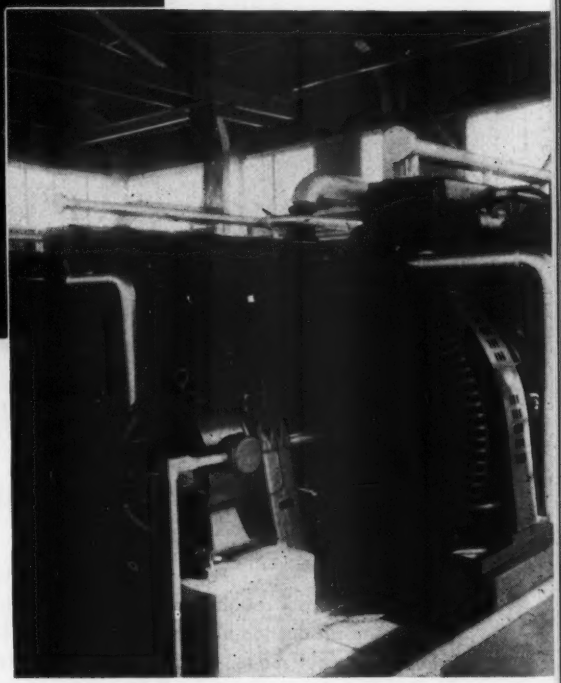


Left: View of six 800-hp. engine-driven compressors at the new Venezuelan pressure-maintenance operation

Below: Three 675-kva. 2,400-volt a.c. generators driven by 800-hp. angle-type gas engines furnish power for plant motors and lighting



to the intake scrubbers of the plant are buried at road crossings only. A gas line connects the 50-psi. field trap at one field gas-oil separation station to the 50-psi. intake scrubber of the plant. Another line connects the 150-psi. field traps from that and two other stations to the 150-psi. intake scrubber of the plant.

The high-pressure discharge gas from the compressor plant can be returned to seven input wells through seven separate 4-in. input lines. A separate recording orifice meter is installed near the plant on each of the seven injection lines. Only three input wells are being used at this time, however, with the gas being returned into two producing horizons.

Two wells inject some 8,000,000 cu. ft. daily in the F-7 sand at 6,000 ft. subsea (average elevation 900 ft.). One of these wells produces from the M (upper) sand with gas for F-7 sand going down the casing. This sand is the largest reservoir in West Guara field, varying in net thickness from 35 to 108 ft.

The third injection well returns about 3,000,000 cu. ft. daily to the Oficina 6 (upper) sand at 4,700 ft. subsea. This sand, not as widespread as the F-7, has a net thickness of 20 to 30 ft. In this well gas is returned through the casing to the Oficina 6 sand while the F-7 sand produces through the tubing.

Six 800-Hp. Compressors

Total installed compressor horsepower is 4,800. The maximum design load is based on the operation of five 800-hp. compressors on 150-psi. gas, and one 800-hp. compressor on 50-psi. gas. All gas is discharged from the plant at approximately 1,800 psi.

Three-stage compression is used in the plant, 50 to 150 psi. suction to 1,800 psi. discharge. There are provisions made for 2,500 psi. discharge and consequent higher intermediate pressures. No final cooling of the 1,800-psi. gas is done.

Calculations for the plant design were based on the following composition of incoming gas as determined by separator samples at approximately 150 psi.:

Component—	Mol %
Nitrogen	2.06
Carbon dioxide	0.21
Methane	70.62
Ethane	14.06
Propane	7.96
Isobutane	1.59
Normal butane	1.95
Isopentane	0.63
Normal pentane	0.37
Hexanes	0.30
Heptane plus	0.25
Total	100.00

Two cases of compression conditions, corresponding to maximum and minimum, were selected for design purposes. Case 1 corresponds to five of the 800-hp. compressor units being on gas-compression service from 150 to 1,800 psi. Case 2 corresponds to two of the 800-hp. machines on 150 to 1,800-lb. service and four of the units on 50 to 1,800-psi. service. The plant currently is operating under the conditions shown in Case 1. The approximate gas quantities to be handled, and the condensates to be produced in Case 1 and Case 2 are shown below:

Case—	1	2
Compressors (800-hp. each):		
150 psi. intake	5	2
50 psi. intake	1	4
Gas to compressors, M.c.f./D:		
150 psi.	25,665	10,266
50 psi.	3,754	15,016
Gas to input wells, M.c.f./D:		
1,800 psi.	28,894	24,851
Condensate to stabilizer, g.p.d.	17,256	14,064

Intake and interstage scrubbers, and the compressor piping are sized to permit cutting all compressors to either 50 psi. intake or 150 psi. intake service while discharging at 1,800 psi. In addition, all major items of the initial equipment provide for possible future maximum operating pressures of 200 psi. on the first interstage separator, and 1,000 psi. on the second interstage separator. To obtain the desired flexibility between the 50 and the 150-psi. intake systems, first interstage and second interstage atmospheric cooling sections are provided for each compressor and ar-

LESS DOWN TIME with

Heavy-Duty KOEHRING 205 PULL SHOVEL

for your toughest trench jobs

For trenching through the hardest materials on your roughest oil field and pipeline work, you can keep production high and costs low with Koehring 205 heavy-duty pull shovel. Built heavy and tough throughout to take the beating of oil field service, it gives you less down-time, more work-time.

Husky shovel boom *plus* rigid dipper stick are extra strong for digging through rocky materials, hold alignment . . . dipper never turns away from cut. Long, deep digging reach to 15'-3", powerful ½-yard bite and easy dumping mean high output on tough trenching jobs. Double fulcrum clutch that reduces amount of manual operating effort . . . independent traction to travel, swing and operate boom all at the same time . . . and boom that handles both pull-shovel and crowd shovel work, are just a few of many Koehring 205 features that assure you more production at lower cost.

In addition to pull shovel and crowd shovel, this Koehring 205 can also be quickly converted to dragline, clamshell, crane or pile driver . . . is available on crawlers, pneumatic tires or truck mounted, to meet the specialized type of work required for oil field operating conditions.

Your Koehring distributor is experienced in oil field problems . . . will analyze your trenching, excavating and other materials-handling requirements in the interests of greatest efficiency, production and savings for *you*. For complete facts and figures, see your Koehring distributor today. In Texas it's ALAMO IRON WORKS, San Antonio . . . BARTHOLOW MACH. CO., Dallas . . . GOODMAN BROS., Midland . . . F. S. RAY CO., Houston. In Oklahoma see CLARENCE L. BOYD CO., Oklahoma City and Tulsa. You'll find Koehring distributors ready to work with you in all other major oil field centers, as well.

A size to suit every job:

Koehring 205	Shovel, Pull Shovel — ½ yard Crane Lifting Capacities: Crawlers: 13,800 lbs. Truck: 20,000 lbs.
Koehring 304	Shovel, Pull Shovel — ¾ yard Crane Lifting Capacities: Crawlers: 23,100 lbs. Truck: 40,000 lbs.
Koehring 605	Shovel, Pull Shovel — 1½ yard Crane Lifting Capacity: Crawlers: 60,760 lbs.

Crawlers: 75% Rating — Truck: 85% Rating.

KOEHRING HEAVY-DUTY

KOEHRING COMPANY
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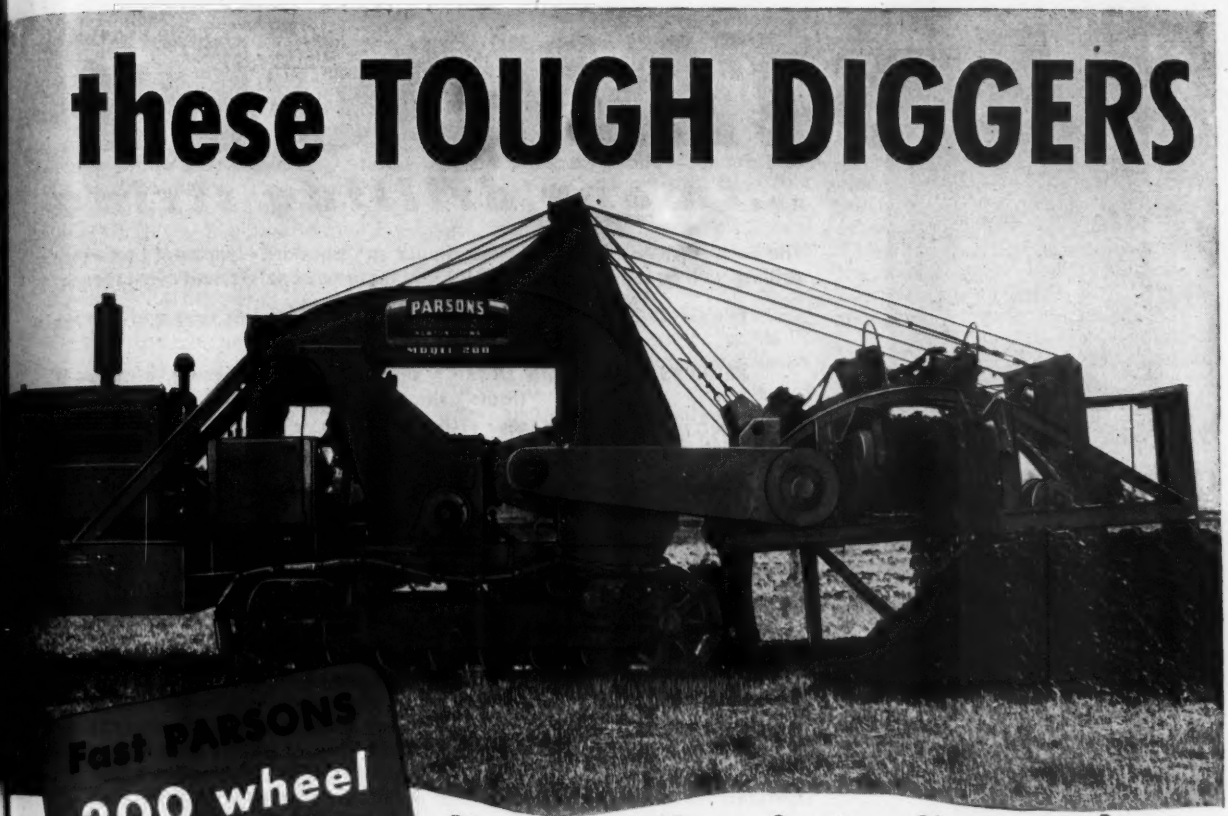
these TOUGH DIGGERS



Fast PARSONS 200 wheel TRENCHLINER* digs a mile of pipeline a day

Where you want to push through every possible foot of pipeline trench per day, Parsons 200 wheel Trenchliner is the big-production, lowest cost answer. Because it digs as fast as 20' per minute, this pipeline Trenchliner sets a fast pace for your pipe gang . . . puts gasoline, oil and natural gas lines through in a hurry. A mile a day is not uncommon. Trenchlines 15" to 26" wide, up to 5'-6" deep . . . delivers clean, smooth-walled, round-bottomed trenches, ready to receive pipe without the added cost of hand trimming.

And you get this dependable, high-production digging day after day, because the Parsons 200 Wheel Trenchliner is built big and tough, with high quality in every detail. Heavy-duty wheel is supported at 4 points, is held firmly at bottom by 2 double-wheeled dollies where digging pressure is greatest . . . arched wheel-frame is truss-bridge constructed, rigidly supports both digging wheel and conveyor . . . resists distortion, keeps wheel precision-aligned for accurate grading. All main operating gears are fully enclosed in steel cases, run in continuous oil baths . . . minimize maintenance, reduce friction loss to minimum, give you longer, trouble-free service.

For complete facts and figures, see your Parsons distributor today. In Texas it's ALAMO IRON WORKS, San Antonio . . . BARTHOLOW MACH. CO., Dallas . . . GOODMAN BROS., Midland . . . F. S. RAY CO., Houston. In Oklahoma see CLARENCE L. BOYD CO., Oklahoma City and Tulsa. You'll find Parsons distributors ready to serve you in all major oil field centers, as well.

Check these Model 200 features:

DIGGING WIDTHS.....	Buckets only:	15"	18"	21"
	With side cutters:	20"	23"	26'
DIGGING DEPTH.....	5'6"			
DIGGING SPEEDS.....	50 — from 2.5" to 236" per min.			
TRAVELING SPEEDS.....	5 — from ½ to 2.7 M.P.H.			
CONVEYOR BELT SPEEDS.	5 — from 45 to 330 feet.			
POWER.....	Gas — Waukesha 6 cyl., 55 H.P.			
	Diesel — International 4 cyl., 55 H.P.			
TRACTOR TYPE CRAWLERS	Optional equipment for pipeline work.			
TILE BOX.....	Optional — for tile laying.			
SPECIAL GUMBO LIP.....	Optional — replaces teeth for digging in gumbo.			

Trenchliners also available in 4 other sizes.

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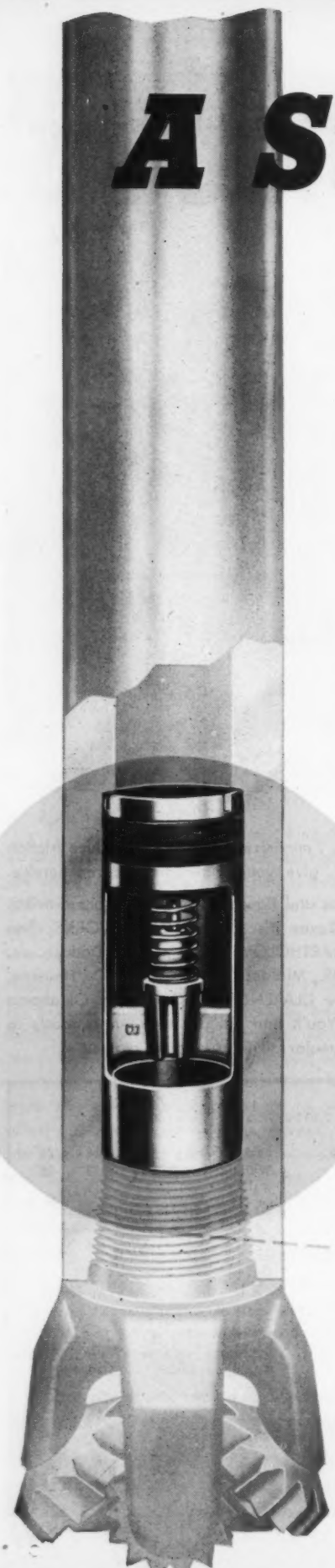

A STANDOUT

...in any drilling string

The Baker BAKWIK Drill Pipe Float should be "standard equipment" on every drilling well because it provides *all* these features of safety and convenience:

PREVENTS PLUGGING THE BIT, with the danger, lost time and annoyance of pulling wet strings;

RELIEVES WEIGHT ON DERRICK and other rig equipment, because it "floats" the drilling string;

LENGTHENS LIFE OF WIRE LINES AND BRAKE BANDS due to reduced weight of the drilling string, which is "floated in";

MINIMIZES OR PREVENTS SERIOUS DAMAGE in event the drilling string should part while running-in or coming-out of the well;

DOES NOT INTERFERE WITH DRILLING;

NO TOOLS OR WRENCHES NEEDED to install or remove valve assembly.

The Baker BAKWIK Model "B" Drill Pipe Float Valve Assembly (Product No. 481) can be positioned in a valve chamber in the drill collar, immediately above the bit — see illustration — where it provides maximum safety and convenience during all drilling operations. Any manufacturer of drill collars will provide this valve chamber for you upon order, or the machining can be done easily in a field shop from blueprints which we will be glad to furnish.

Another method of installation is to use a BAKWIK Drill Pipe Float "Body" (Product No. 480) which is placed at any desired point in the drilling string above the bit. The BAKWIK Float Valve Assembly is then dropped by hand into this Body, and is held in position by the tool joint pin above it. If an unrestricted fluid passageway is desired (for running surveying devices or other purposes) this Valve Assembly is quickly and easily lifted out by hand.

Safeguard your drilling operations — free your crews from messy wet strings — save wire lines, brake bands and rig equipment by installing Baker BAKWIK Drill Pipe Floats — Available at *your* supply store, where you can later secure any of the inexpensive wearing parts for servicing *right on the derrick floor.*

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DRILL PIPE FLOAT

ranged to permit cutting to either system as desired.

Stabilization of Condensate

In the three-stage compression of the gas from 50 to 150-lb. suction pressure to 1,800 psi. discharge pressure, gasoline condensate is produced at the interstages. This condensate can be stabilized by the plant to 21 and 10-lb. R.v.p. gasolines in alternate operations. If a 21-lb. gasoline is produced it is discharged directly to the Meneg crude line which is approximately 1 mile distant. If the stabilizer is operated to make a 10-lb. product it is run to storage for use as motor fuel.

Design of the stabilizer plant is for a nominal charge of 50,000 gal. per day of compressor condensate. This capacity allows for a 100 per cent future compressor-plant expansion. The stabilizer can be operated at high pressure to retain a maximum amount of butane. In the case of compressor-plant operation at higher discharge pressure than 1,800 psi., the lighter fractions in the condensate may be flashed off in the stabilizer feed drum to maintain satisfactory operation of the stabilizing column.

Condensate from the compressor plant enters the stabilizer feed drum (which is also designed for water settling and drawoff), and the light fractions are flashed to the fuel gas line to lighten the load on the stabilizers. Flashed hydrocarbon liquid from this drum forms the feed for the stabilizer, and is preheated by exchange against the bottom product before entering the column.

The stabilizer can produce a controlled bottom product ranging from 10-lb. R.v.p. to 21-lb. by control of the operating temperature and pressure. This is accomplished by a recording temperature controller actuating on the steam input of the reboiler, while constant reflux and feed are maintained by recording flow controllers. The operating pressure is set in accordance with the desired bottom product and maintained by a recording pressure controller in the gas product line from the reflux drum. The steam condensate from the reboiler is conducted to a condensate drum and returned to the boilers.

The stabilizer tower is 3.5 ft. in diameter by 76 ft. high, and contains 30 bubble-cap trays placed on 24-in. spacing. Maximum operating pressure is 300 psi.

Utilities and Auxiliaries

The new Meneg plant includes all necessary utilities and auxiliary facilities for efficient plant operation. The major part of the auxiliary units, such as pumps, air compressors, etc., are electrically motor driven.

Power for the operation is supplied from three 675-kva., 2,400-volt, alternating-current generators driven by 800-hp. angle-type gas engines. The excess power is made available for transmission through high-line facilities to the San Tome camp of Mene Grande.

Steam required for reboiler heat for the stabilizer, for operation of various small reciprocating pumps, and for auxiliary building and water-heating services is produced in the boiler plant. Fresh treated water required for boiler feed water, cooling-tower makeup, service (laboratory, personnel, and equipment washing) and fire protection is supplied from San Tome camp.

Field Has 40 Sands

West Guara field is located 3 miles north and west of Mene Grande Oil Co.'s San Tome division headquarters. The pool was discovered by Meneg in 1942, the location being based on reflection seismograph information. The pool now contains 95 producing wells. The oil accumulation is controlled by the West Guara fault. There is excellent structural closure along this single-strike fault barrier, due largely to the barrier being slightly concave to the direction of dip. This fault has been traced by drilling for more than 8 miles and is downdip to the south with a maximum displacement of about 500 ft.

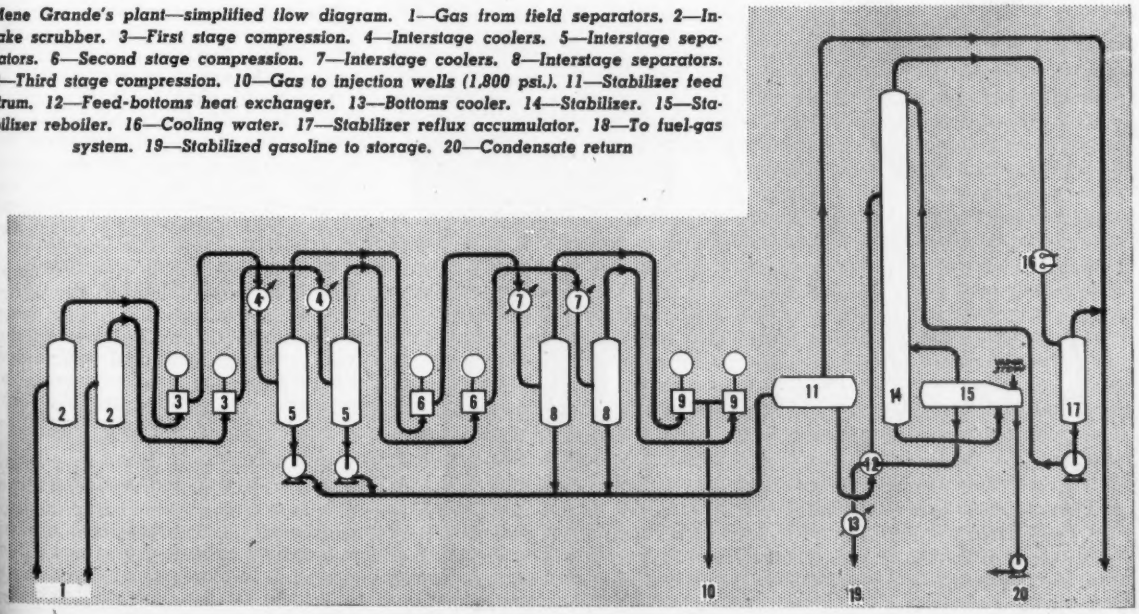
The favorable structural feature of the West Guara fault is repeated down the geologic section from sand to sand, and results in a very unusual multizone cumulation of oil. The field, therefore, is very compact, there being on the order of 460,000 acre-feet of oil sand altogether under only 3,000 surface acres.

There are about 40 sands through the stratigraphic section at West Guara which have been found productive. Practically all of these zones are separated from one another by well-defined and persistent shale breaks.

The zones carry oils of different character. For example, the gravity ranges from a low of 17° to a high of 56° A.P.I. (the average gravity is 38.5°). Some of the crudes are designed as wax oils while others are nonwax bearing. In general the shallower oils are waxy and the deeper crudes are nonwaxy.

At West Guara the oil accumulation in each of the zones has its own distinctive gas-oil and oil-water contacts. With the permeability varying greatly from sand to sand, Mene Grande has followed the desirable practice of producing each individual

(Continued on page 101)



Mene Grande's plant—simplified flow diagram. 1—Gas from field separators. 2—Intake scrubber. 3—First stage compression. 4—Interstage coolers. 5—Interstage separators. 6—Second stage compression. 7—Interstage coolers. 8—Interstage separators. 9—Third stage compression. 10—Gas to injection wells (1,800 psi.). 11—Stabilizer feed drum. 12—Feed-bottoms heat exchanger. 13—Bottoms cooler. 14—Stabilizer. 15—Stabilizer reboiler. 16—Cooling water. 17—Stabilizer reflux accumulator. 18—To fuel-gas system. 19—Stabilized gasoline to storage. 20—Condensate return

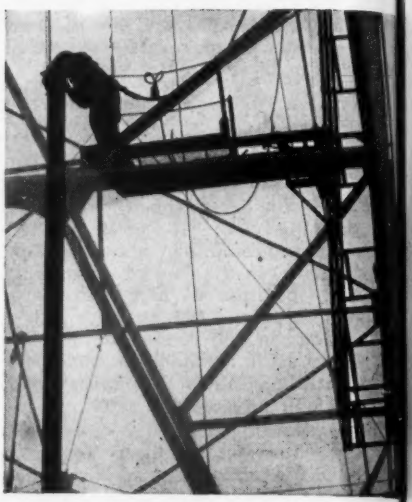
Safety and Speed in Running Casing With Adjustable Stabbing Board

by Leigh S. McCaslin, Jr.

WIDESPREAD interest has been created in oil-well-drilling circles by the development of a safety adjustable stabbing board for running casing. Such a device was recently perfected by C. L. Calhoun, veteran tool pusher for Penrod Drilling Co. at Shreveport. Calhoun conceived the idea for this device in trying to eliminate accidents which have been frequent and severe from the use of makeshift methods formerly used.

For many years it has been common practice to place a 2 by 12-in. board up about the fourth girt for the derrick man to stand on while stabbing casing. Many accidents occur while using this makeshift platform, the most common being slips and falls. In some cases, moreover, this board was not removed immediately after the casing was run and the traveling blocks would swing into this board, causing it to fall on crew members working on the floor.

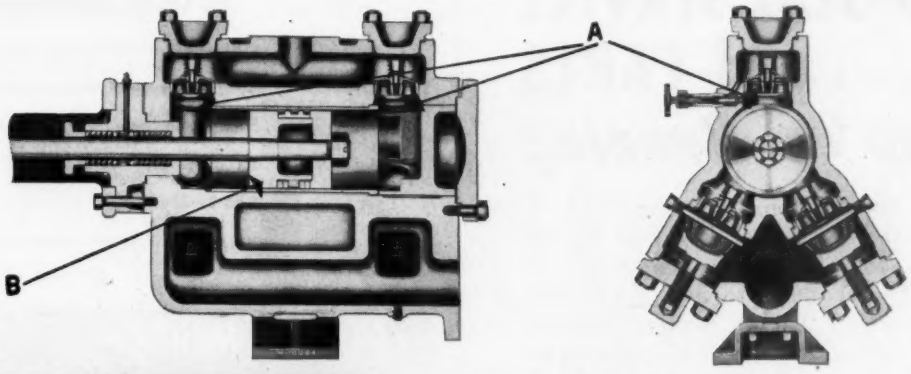
Safety was Calhoun's first concern in developing the new board. However, critical shortages of pipe have added a great time-saving feature, because of wide variation in the length of joints which are commonly found in almost all strings of pipe now being run. Since the board is quickly adjustable from the first girt upward for a distance of 25 ft., the derrick man can easily and quickly get into position to handle joints of pipe from 10 ft. in length up to 40 ft.



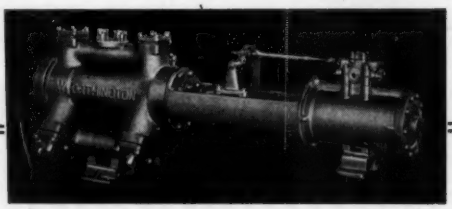
Extreme left: Platform is adjusted to the correct height to stab a 30-ft. joint. Left: C. L. Calhoun, Penrod Drilling Co. tool pusher, inventor of the safety adjustable stabbing board. Above: Platform is equipped with chain handrails but as an additional precaution derrick man wears safety belt with tail line attached to carriage

The board consists of an A-frame which fastens to the side of the derrick, which carries a track for a carriage. Attached to the carriage is a 36 by 72-in. platform. This platform is floored with expanded metal for safe footing and is provided with 36-in. uprights at each corner which support chain handrails. At the top of the A-frame is a worm-driven winch, powered by a 1-hp. a.c.-d.c. electric motor.

A push button on the platform marked "Up" and "Down" allows the derrick man quickly to raise or lower the platform to any position on the track. As an additional precaution the side of the track nearest the platform is provided with cleats, which prevent the platform from falling in case the winch or winch cable should break. In lowering the platform the operator holds a pedal down to release a safety catch from engaging the cleats. The platform can be adjusted to project close or farther away from the center of the derrick by a hand ratchet. The whole device,



HiVol features for maximum volumetric efficiency in handling volatile liquids: (A) Valves placed immediately above and below cylinder bore for straight upward flow and closest clearance; (B) Extra-long liquid piston makes clearance even less.



Worthington HiVol Pumps are Horizontal Simplex Direct-Acting.

Highly volatile liquids often flash into vapor during pumping. If this vapor becomes trapped in the pump's liquid cylinder, it merely compresses and expands there, blocking the flow of liquid. But if the vapor is compressed in a small enough space, the high pressure developed will open the discharge valves and free the gas.

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In Worthington HiVol Pumps the valves are immediately adjacent to the cylinder bore, and so arranged that flow is in the straight-upward, natural path of gases. Long connecting passageways are eliminated, while extra-long pistons further aid in providing closest possible clearance.

Many Other Advanced Features combine to make Worthington HiVol Pumps unbeatable for economical, trouble-free handling of volatile and compressible liquids. Send for Bulletin W-113-B32, with HiVol details proving *there's more worth in Worthington. Worthington Pump and Machinery Corporation, Reciprocating Pump Division, Harrison N. J.*

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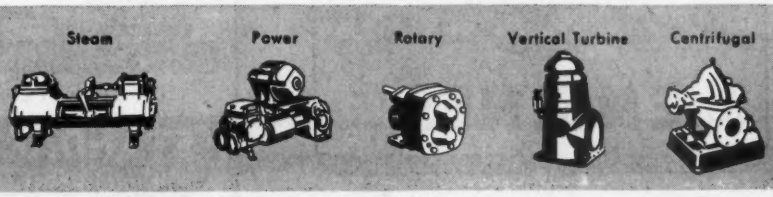

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while being constructed of sturdy steel angles and channels, is light enough quickly to be brought onto the derrick floor and raised into position with a catline and then fastened with six J-bolts to the girts. In most cases 20 minutes is all the time required to install the board.

In running a 6,000-ft. string of casing in lengths which varied from 14 to 44 ft., one contractor reported that he saved 3 hours on the job as compared with a similar job using the old method. Another contractor, running a 12,000-ft. string of mixed-length pipe, reported saving 6 hours by use of this new device.

Uses Besides Stabbing

In addition to its use as a stabbing board, several other time-saving uses have been found for it. For example, the traveling block can be greased easily from the platform. Repairs to the swivel are facilitated. Mud hose can be removed or attached to the swivel. The hookup for making drill-stem tests can be done quickly and easily. One side of the traveling block can be painted from the platform and the other side can be painted from the monkey board while the rig is in operation. After casing is on bottom, very little effort is required to attach the cement head, from the adjustable platform.

It is common practice to install this safety adjustable stabbing board before surface pipe is run, and it is left up in the derrick until the well is completed. The platform folds back out of the way against the side of the derrick when it is not in use.

Merritt Tool Co., of Kilgore, Tex., is now manufacturing this board, and it will soon be available in quantities to supply the drilling contractor's needs.

Mene Grande West Guara Plant

(Continued from page 97)

reservoir through separate conductors. Specifically, this is by means of two and three-stage completions.

Program for Gas Injection

For the pressure-maintenance and repressuring program, each individual reservoir in the field was carefully studied by Mene Grande engineers and much basic information collected. These data pertained to the size and shape of the reservoir, core analyses, analyses of reservoir fluids, bottom-hole pressure information, production decline curves, and gas-oil-ratio histories. Following these engineering studies, a number of "top candidates" of the oil reservoirs best suited for gas injection were selected.

Most of the West Guara reservoirs had original or virgin gas caps which from first production to date have expanded somewhat. The updip injection locations, therefore, cause the gas to be injected into these already existing gas caps. Incidentally, natural gravity drainage operates to a substantial degree in a number of the reservoirs because of the presence of good vertical permeability.

The following discussion and the factors given in Table 1 summarize the reasons for the selection of the four reservoirs to be operated by pressure maintenance. Character and producing conditions for these are:

Reservoir D_2—The high oil gravity, good structural conditions, and overlying gas cap make gas injection favorable. Present well distribution is

TABLE 1—DATA ON WEST GUARA RESERVOIRS FOR GAS INJECTION

Sand	Acre-feet in reservoir	Oil gravity (°A.P.I.)	Porosity (per cent)	Water saturation (per cent)	Shrinkage (per cent)	Stock tank oil in place (mil. bbl.)
D_2	20,700	40-42	28	15	37	24.0
D_1	13,050	39-44	29	15	40	15.0
F_1	68,380	40-43	29	15	40	78.5
H	22,540	38-42	25	20	28	21.7

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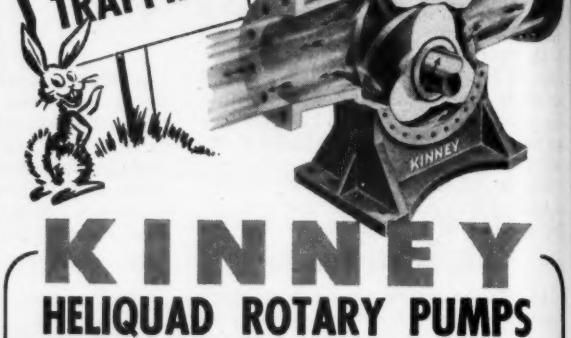

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unsatisfactory for water injection.

Reservoir D_4—Condition similar to D_3. The same wells could be used as injection wells in the gas cap, as in D_3.

Reservoir F_7—Conditions favorable for gas injection, as in D_2 and D_4 sands. Well distribution is poor for water injection.

Reservoir H—Well-developed gas cap, high-gravity oil and good structural conditions favor gas injection. Large water-oil contact would necessitate too many wells for efficient water-injection drive.

The injection of water may be more suitable than gas for some of the 40 producing sands; to others neither type of injection is feasible.

The plans call for the injection of gas into the following four sands:

Sand	Rate of injection (M.c.f./D)
D_3	4,000
D_4	5,000
F_7	13,000
H	8,000
Total	30,000

Unitization Studied

The Mene Grande wholly owned properties in West Guara field consist of some 50 to 60 per cent or so of the total, as based on the surface area (not reserves). This makes up roughly the east one-half of the field. The center "inside" of the west half of the field are Meneg-Creole properties, while the outside west half is owned by Socony-Vacuum Oil Co. of Venezuela. Moving toward unitization of the entire field and possible pressure maintenance of complete reservoirs, the three companies recently have formed the West Guara Engineering Committee. The committee already has held meetings at San Tome and at Caracas.

The problem of unitization is being approached by working out the following steps (a procedure which might well be considered as a "model" or ideal for many fields):

1. To ascertain the net sand thickness for each sand in every well in the field, and to prepare structure isopach maps on each reservoir.
2. To determine the original gas-oil and oil-water contacts for every reservoir.
3. To planimeter areas and calculate the sand volumes in the oil columns by reservoirs by concessions, and then do likewise for the sand volumes within the gas caps.
4. Establish values of porosity, connate water, and formation-volume factors for each reservoir.
5. Calculate the barrels of stock-tank oil initially in place in each reservoir.
6. Establish the probable recovery factors for each reservoir and calculate ultimate recoverable oil.
7. Tabulate accumulative oil production for each reservoir, and then calculate remaining oil reserves.

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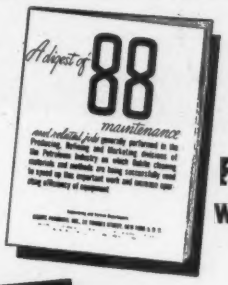

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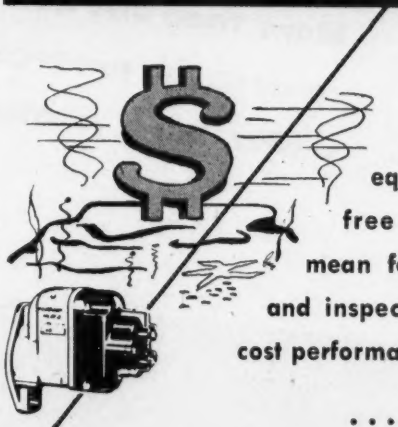

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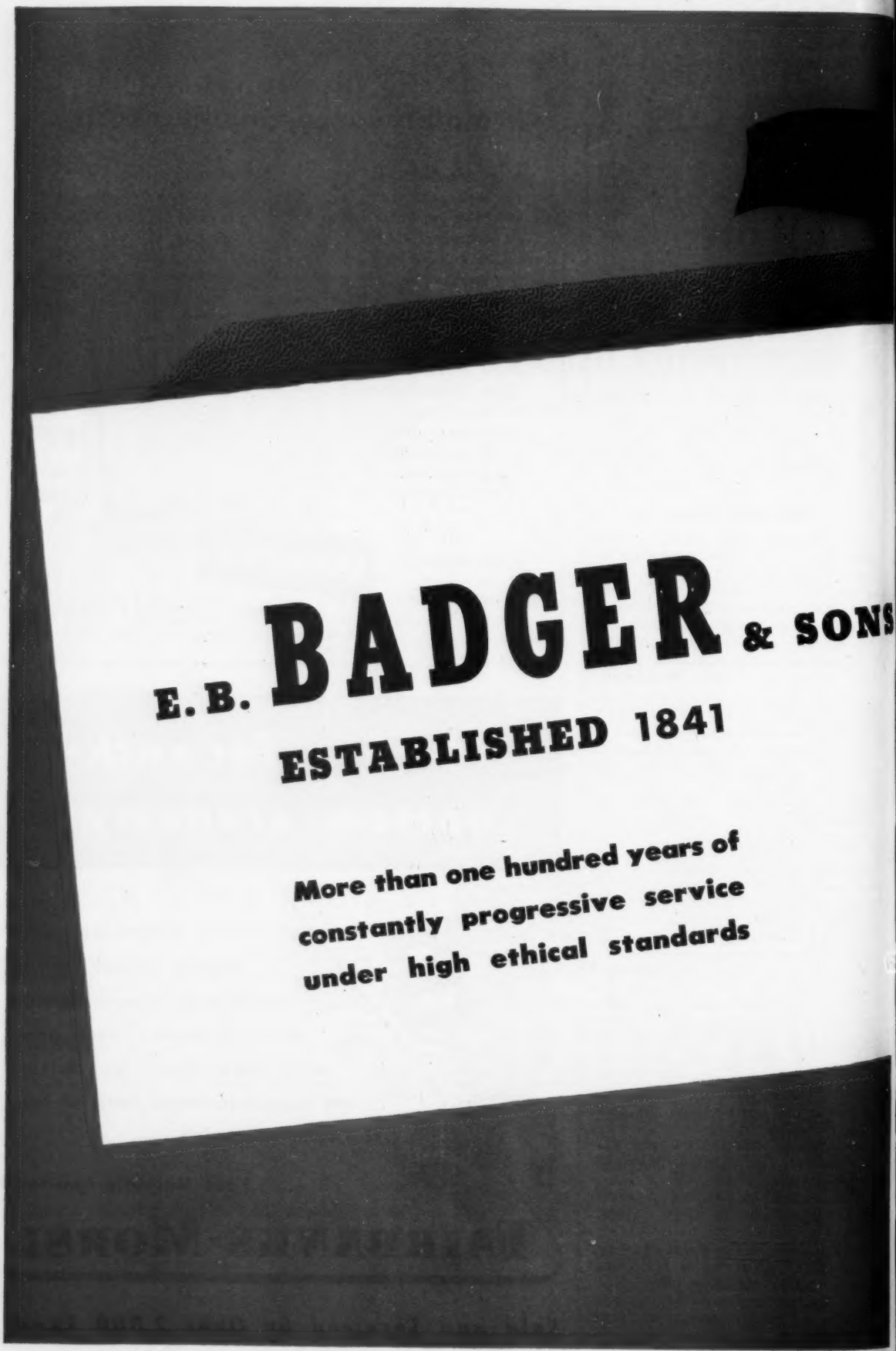
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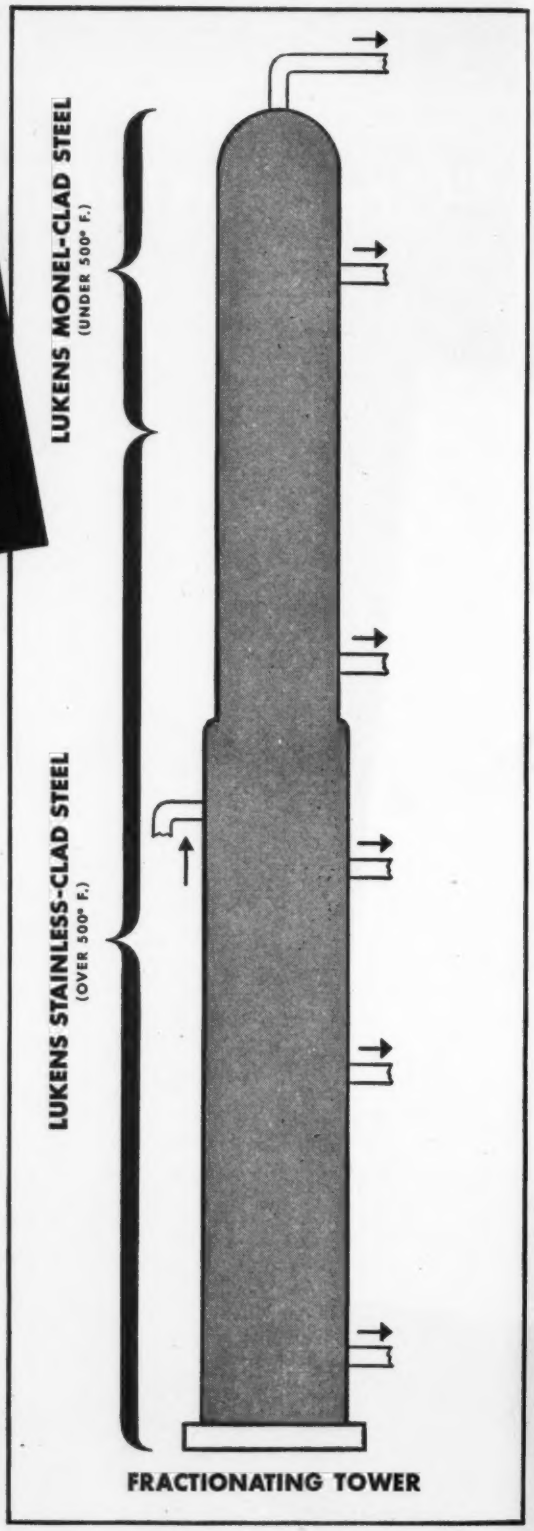

"Practically standard now for corrosion-resistant construction", says a petroleum engineer about this division of corrosion-resisting responsibility between two Lukens Clad Steels. Stainless-Clad in the lower section withstands the attack of crudes that are high in sulfur. Monel-Clad successfully resists the acids that form at the top, and is applicable for temperatures under 500°F.

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Each Lukens Clad Steel is a precision product from assembly to finish, consisting of a uniform thickness of the corrosion-resisting metal permanently bonded to an ASME quality backing plate. Plate sizes run up to 178″ wide, or $\frac{3}{16}$″ to over 3″ thick, with cladding in percentage of total plate thickness to suit your requirements.

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PROGRESS IN METALS

by W. L. Nelson
Consulting Engineer

Vessels Tested at —320° F.

LOW-TEMPERATURE impact strength is becoming more and more vital to the petroleum and synthetic-fuel industries. Low temperatures have always been employed in the dewaxing of petroleum oils, but recently large quantities of ethylene and other light gases are being fractionated at exceedingly low temperatures. In addition, liquid oxygen will be produced in large amounts for the gas-synthesis plants being built in Texas and in Kansas, and even lower temperatures are encountered in such plants. The impact test described here is a practical one in which actual (small) vessels were tested by dropping a weight on them, whereas most impact tests are conducted on laboratory specimens yielding results that cannot always be translated into plant performance.

For the purpose of the tests, five pressure vessels (see Fig. 1) were constructed to designs which incorporate most of the features of full-sized commercial vessels. Each was approximately 3½ ft. long over-all, with an outside diameter of 12½ in. and wall thickness of $\frac{5}{16}$ in. They were fitted with dished heads welded at the horizontal seam. The vessels differed only in the base materials and welding rod used and the heat treating and stress relieving involved, except that one of the three 8½ per cent nickel-steel tank cylinders was made in two sections with two horizontal welds.

Three of the vessels were of the new 8½ per cent nickel low-carbon steel (A.I.S.I. 2800), one was carbon steel, and one was of Type 304 stainless chromium-nickel steel. All materials were from commercial melts. The 8½-in. nickel and the carbon steel (A.S.T.M.-Spec. A-201) vessels were from open-hearth melts made by Lukens Steel Co. The stainless steel was furnished by Crucible Steel Co. of America. The heads were hot spun by Lukens and the tanks fabricated by Alloy Fabricators, Inc., Perth Amboy, N. J. Heat treatments before and after fabrication are shown in Table 1. All major joints were completely X-rayed and vessels were all subjected to a 700-lb. hydrostatic test for 15 minutes. In making the low-temperature tests, the vessels were kept filled with liquid nitrogen at all times to maintain a constant temperature of —320° F.

The vessels were placed in a special testing device designed by Air

(Continued on page 112)

TABLE 1—HEAT TREATMENT OF HEADS AND PLATES BEFORE FABRICATION

Carbon steel	Normalized from 1,650° F.
8½ per cent nickel steel	Double normalized from 1,650° and 1,450° F.
Type 304 stainless steel	Annealed (water quenched) from 1,800° F.

HEAT TREATMENT AFTER FABRICATION

Type of material	Weld rod used	Stress relief treatment
Carbon steel (A.S.T.M. A-201)	E6015	1,100° F., 2 hours
8½ per cent Ni steel	25-20 (Type 310)	1,050° F., 4 hours
8½ per cent Ni steel	80 per cent Ni-12 per cent Cr alloy	
8½ per cent Ni steel	25-20 (Type 310)	None
Stainless steel (Type 304)	(Type 304)	None

TABLE 2—CHEMICAL COMPOSITION AND IMPACT PROPERTIES OF SOME COMMERCIAL HEATS OF 8½ PER CENT NICKEL STEEL
(All specimens double normalized and reheated to 1,050° F.)

	Chemical composition (per cent)				Charpy impact (keyhole notch) (ft.-lb.)	
Section—	C	Mn	Si	Ni	70° F.	—320° F.
¾-in. plate	0.11	0.26	0.26	8.35	50 to 54	26 to 30
⅞-in. plate	0.09	0.81	0.21	8.09	66 to 81	27 to 32
1-in. plate	0.10	0.75	0.23	8.63	50 to 54	26 to 30

TABLE 3—TENSILE PROPERTIES OF QUENCHED, AND QUENCHED AND REHEATED, 8-9 PER CENT NICKEL STEEL*

	Tensile strength (psi.)	Yield point (psi.)	Elong. per cent in 2 in.	Red. of area (%)	Brinell hardness
Oil quenched	178,000	119,000	15.0	55.0	361
Oil quenched, reheated 1,050° F.	116,300	78,000	31.0	60.0	254
Water quenched	178,750	126,000	15.0	56.0	368
Water quenched, reheated 1,050° F.	116,000	79.000	32.0	67.0	307

*Composition (per cent) of 0.10 C, 0.75 Mo, 8.65 Ni.

Fig. 1—(Left) Four of the vessels after testing them. They were filled with liquid nitrogen to keep them at —320° F. and subjected to the impact of a 292.9-lb. weight dropped from 5 ft. The carbon-steel vessel (broken) was struck with a weight of only 184.9 lb. Fig. 2—(Right) Shattered carbon-steel vessel

Western Michigan Experiencing Big Exploratory Play

by Charles J. Deegan

MICHIGAN is looking forward to 1949 as possibly the year in which a real upturn in production will be achieved, thanks to an exploratory boom now well under way in some nine counties in the western part of the state. Incidentally, some portion of this new western play may bring Michigan more prominently into the picture in the tidelands oil case.

While not generally realized, the State of Michigan has already granted two leases on submerged lands, one under Saginaw Bay on the east side of the state, the other under Lake Michigan on the west side. In both instances the leases were for sufficient acreage to fill out a standard drilling unit. State geologists and conservation officials are confident that sooner or later important oil reserves will be found to extend under the waters of both Saginaw Bay and Lake Michigan, and are therefore keeping a close eye on the tidelands cases. In addition, the state has for years collected royalties on sand and gravel dredging operations in the Great Lakes areas.

The State Conservation Commission is on record as being opposed to offshore drilling operations, because of the possibilities of water pollution, navigation hazards, and perhaps interference with recreation opportunities. This latter is an important item in Michigan's tourist business, an important segment of the state's economy. However, there is no opposition to directional drilling if that should prove feasible.

A glance at the structural-trends map (See Fig. 1) accompanying this article will show that the state officials are exercising only reasonable foresight in anticipating that sooner or later the question of oil rights under both Lake Michigan and Saginaw Bay will become of substantial importance. They say that with 3,121 miles of shore line, and existing structural trends, some offshore oil is almost inevitable.

The exploration play which is now blossoming into a big-scale operation in western Michigan got its start in late 1946 when Carter Oil Co. opened Stony Lake field in Oceana County, producing from the Traverse lime at 1,600-1,700 ft. It picked up momentum in 1947 when Sun Oil Co. opened Kimball Lake field in Newaygo County, also producing from the Traverse, at around 2,300 ft.

But it really got going in a big way when Roosevelt Oil Co. opened Pentwater field in northwest Oceana County in June this year, producing from the Dundee at just under 2,100 ft. Subsequently shallower Traverse production has also been found at Pentwater, at around 1,500-1,600 ft.

Geologically all of these fields are on the western updip side of the nearly circular Michigan basin, in shallower areas where previously it had been thought the prospects for porosity development in the Traverse and Dundee were poor. Both are limestone formations.

Core Drilling Pays Off

Furthermore, their discovery offered proof that a core-drilling campaign in the area would pay off in the discovery of structures that would produce oil. Varying thickness of glacial-drift deposits, combined with producing structures that are usually small in area, have made this a difficult country to work. The glacial drift with wide variation in thickness in short distances made geophysical work difficult to interpret, while adding to the cost of such work.

Traverse production usually comes from a reef porosity development found within that formation. Dundee, the deeper pay, usually produces from secondary porosity resulting from dolomitization. As usual in either reef or secondary lime porosity, the relationship of oil production to structure is only general. Curvature of reefs, and sharp changes within a short distance, characteristic of small reef areas, are common. The same rule of sharp changes in short distances is quite likely to apply to porosity in a dolomite zone. The result is a rather high percentage of dry holes, even among field-development wells.

In Michigan, certain trends, or structural axes across the regional basin are recognized as the most favorable places for Devonian production, either Traverse or Dundee. But localizing the producing structures along these trends proved difficult.

The present play is based on a technique of core drilling that is being given a sizable play by Pure Oil Co., Ohio Oil Co., Sohio Oil Corp., and Superior Oil Co., in addition to Carter and Sun. A series of core-hole profiles are run at right angles to the structural axes, the profiles being spaced from 1 to 4 miles apart. When something suspicious is found, the drills are brought back and spaced closer until the local structure is believed defined. These core holes are generally drilled into the Redrock marker in the Coldwater formation in the Mississippian. The average depth to the marker bed is about 750 ft., maximum is about 1,000 ft.

The area most active in the leasing play at this time extends from Township 12 North through Township 29 North, and extends inland about 60 to 70 miles eastward from the shore line of Lake Michigan. (See shaded area on map in Fig. 1.) It takes in the greater part of the following counties, from north to south: Grand Traverse, Kalkaska, Manistee, Wexford, Mis-

MICHIGAN—1948 OIL WELL AND PRODUCTION DATA, BY FIELDS

Field—	Bbl. per day, Sept. 1948	Wells, 10-1-48	Cumulative oil prod. to 10-1-48
Adams	746	50	8,581,726
Arbella	338	31	134,942
Beaver Creek	741	26	165,604
Bloomer	502	13	741,416
Buckeye, No. and So.	553	180	20,513,552
Cato	320	12	227,798
Clayton	375	51	4,596,455
Coldwater	6,378	76	5,959,355
Deep River	7,968	111	9,629,580
Essexville	461	35	1,159,046
Evart	427	26	3,055,049
Fork	1,073	59	6,301,627
Freeman-Redding	620	72	14,887,069
Headquarters	268	28	6,738,160
Hopkins, South	470	2	54,252
Kawkawlin	2,162	192	4,816,254
Kimball Lake	4,030	104	2,146,491
Mount Forest	285	19	145,660
Mount Pleasant	690	163	23,380,848
Norwich, East	879	48	1,687,166
Pentwater	1,848	29	127,136
Pinconning	330	4	202,924
Porter-Yost-Jasper	1,437	283	43,634,720
Reed City	3,598	181	35,686,073
Stony Lake	2,371	27	1,059,540
Walker (Grand Rapids)	743	384	10,790,382
West Branch	565	215	6,295,275
Winterfield-Marion	331	24	4,055,350
Wise	409	62	2,846,759
Miscellaneous pools	3,823	942	65,701,691
Total state	44,741	3,449	285,321,900

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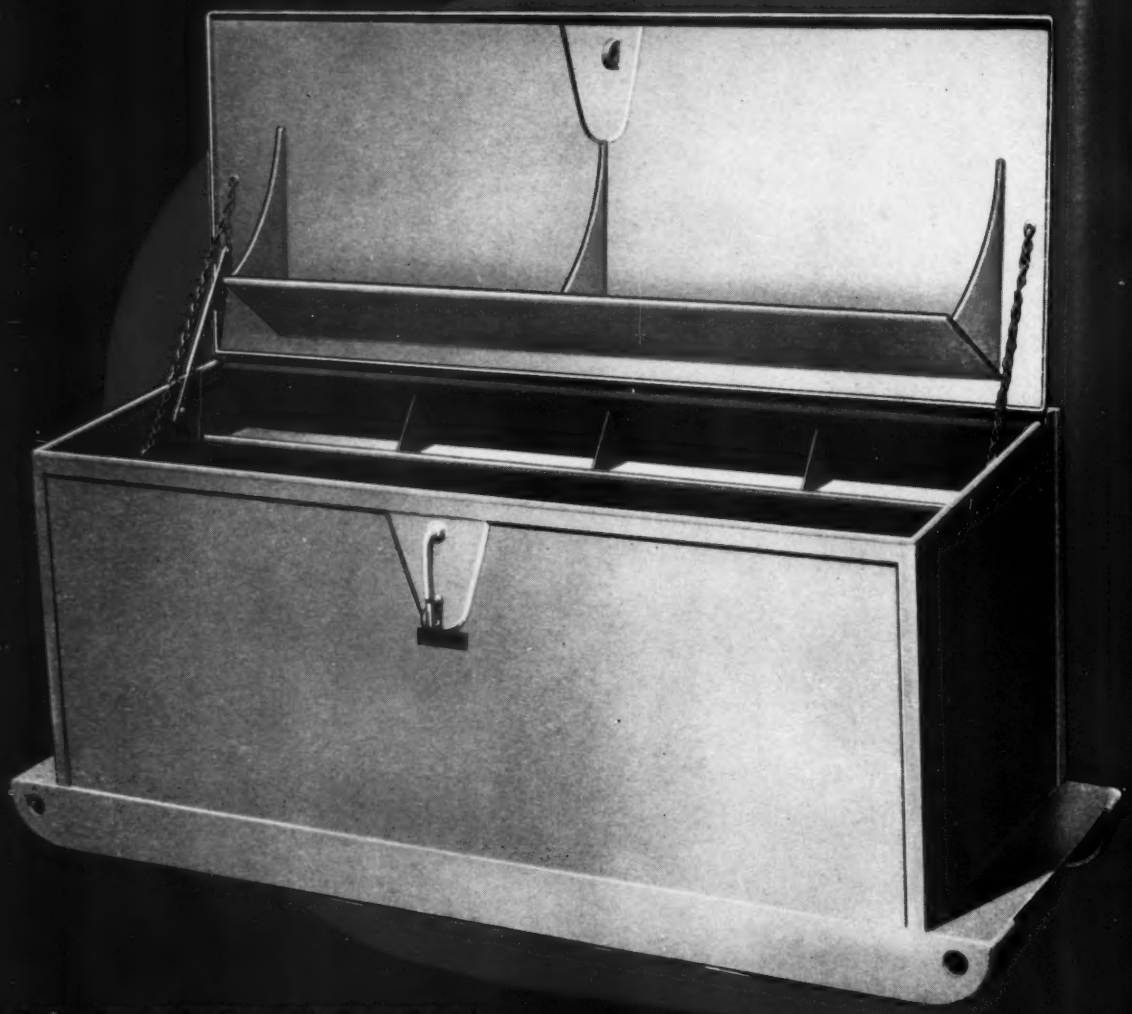
OWEN ALL-STEEL TOOL BOXES ARE AVAILABLE NOW TO PROTECT YOUR TOOLS



Companion to the Owen Work Bench is this Owen All-Steel Tool Box. Made in two sizes, 8' and 5' long, this heavy gauge sheet steel box is added insurance against lost or damaged rig tools, lines or other equipment. They are durable. They are convenient. They are an asset to any modern rig. Order today. You can have all you need, right now.

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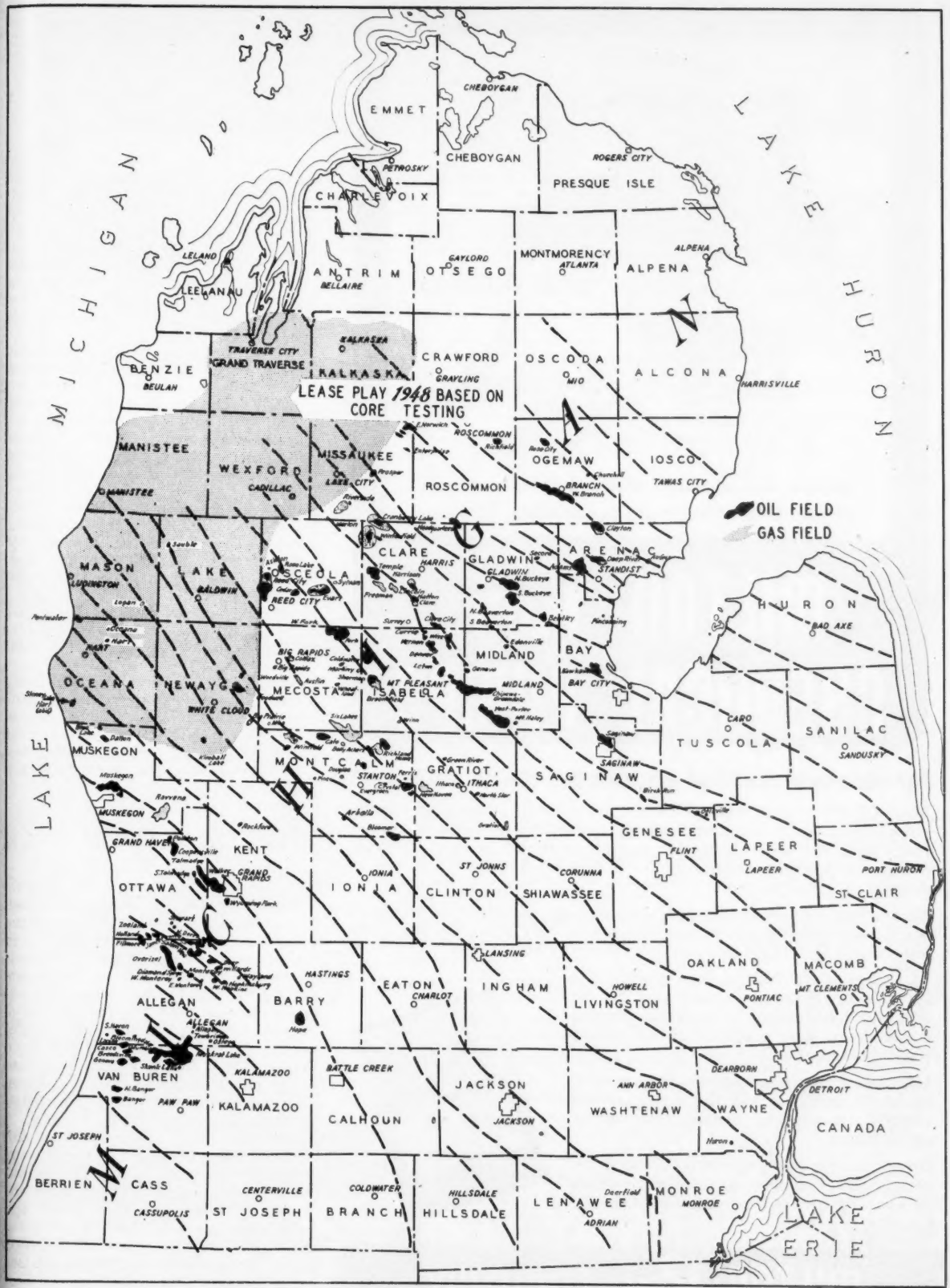
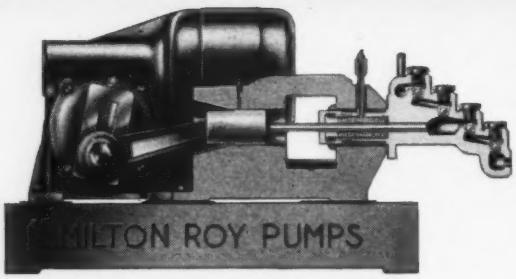
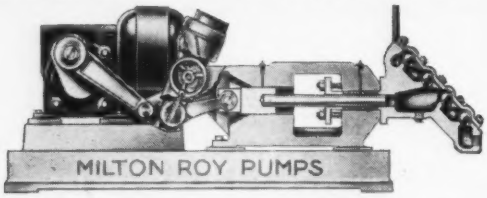


Fig. 1—Map of Michigan showing structural axes along which prospects for Devonian production (Traverse and Dundee limestones) are considered most favorable. Shaded area on west side marks area of hot exploration play now under way. Note that extension of these structural axes to the west indicate possibilities of offshore oil in Lake Michigan; while on the east side, Saginaw Bay is indicated as intercepting several of these axes. Most of Saginaw Bay is comparatively shallow and average depth is reported less than 20 ft.



Stroke Adjustment—Screw. Liquid End—Alloy.



Stroke Adjustment—Micro while running.
Liquid End—Cast Iron, cover plate design.

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Milton Roy Pumps handle difficult materials—slurries and solids in suspension, viscous liquids, solvents, hot or cold oils, other materials too difficult or perhaps impossible to pump by other means.

Liquid ends of Milton Roy Pumps are supplied in any metal or alloy that can be cast and machined, also in certain plastics materials, to meet practically all corrosion resistance requirements.

Milton Roy Pumps are high pressure pumps, up to 20 thousand psi, for high pressure catalysis, hydrostatic testing and similar applications.

Investigate the pump that is tailor-made for each specific purpose—to handle materials in exactly controlled volume. Ask for Catalog No. 146.

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sauke, Mason, Lake, Oceana, Newaygo.

Carter Oil Co. is the recognized leader in this play, and bought nearly 70,000 acres of state land at the last auction, October 28 and 29. This apparently was a climax to a leasing play conducted like a military campaign that still has Michigan operators gasping for breath. Carter is reported to have suddenly brought in some 30 to 40 land men by car and plane and thrown them into simultaneous action in a leasing blitz that rounded up a reported several hundred thousand acres before most people realized what was happening. Presumably most of this acreage was taken in areas where Carter's core-drilling campaign showed favorable prospects.

This year Michigan will probably show a slight increase in production over 1947, thus halting the slow but steady decline of the previous 5 years. Next year, both state officials and operators are hopeful, may be the year that marks the beginning of a long steady increase in the state's yearly output. Currently the state's production is hovering just under the 50,000-bbl.-per-day mark. This compares with a local refining capacity of slightly over 112,000 bbl. per day. (See The Oil and Gas Journal, April 1, 1948, page 228.)

With crude everywhere still rather "tight," Michigan refiners would certainly welcome an increase in local production. It is reported that currently not a barrel of Michigan's crude-oil production winds up outside the state. Even so, that leaves the local refiners with a shortage of about 60,000 bbl. per day, if they had to depend on local production for near-capacity operation.

Progress in Metals

(Continued from page 107)

Reduction Co. A weight of 292.9 lb. was dropped on all of the alloy-steel vessels from a height of 5 ft., on the intersection of the longitudinal and transverse welds joining the heads with the cylinder, and on two points along the longitudinal seam. The force was concentrated by the use of a ¾-in. spherical tup. The same weight was dropped on the flange from a height ¾ in. less than on the seams. The stainless steel vessel was given an additional test along the longitudinal seam.

Because of the lower yield strength of the carbon steel, the weight was reduced from 292.9 to 184.9 lb., but the height of the drop remained the same. The 8½ per cent nickel and the stainless-steel vessels withstood all tests without trace of fracture. The carbon-steel vessel shattered (see Fig. 2) and cracked badly on the first blow.

The composition and physical properties of the new 8½ per cent nickel steel are indicated in Tables 2 and 3.

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Manufacturer's Agent - Oil Well
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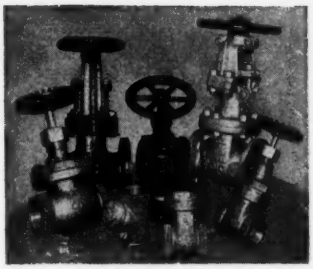

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XL Steel Pipe Couplings for OIL COUNTRY TUBULAR PRODUCTS. Gas-Water-Steam.

THE OHIO INJECTOR COMPANY
Wadsworth, Ohio
OIC VALVES, Bronze, Iron and Steel, for all purposes. "Oh! I see Lower Costs with OIC."

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W. C. Norris swaged nipples, bull plugs, stuffing boxes, sucker rods, polished rods, welding caps and other equipment are backed by 63 years manufacturing experience, assuring the user highest quality for the utmost in efficient performance and service at no increase in cost.

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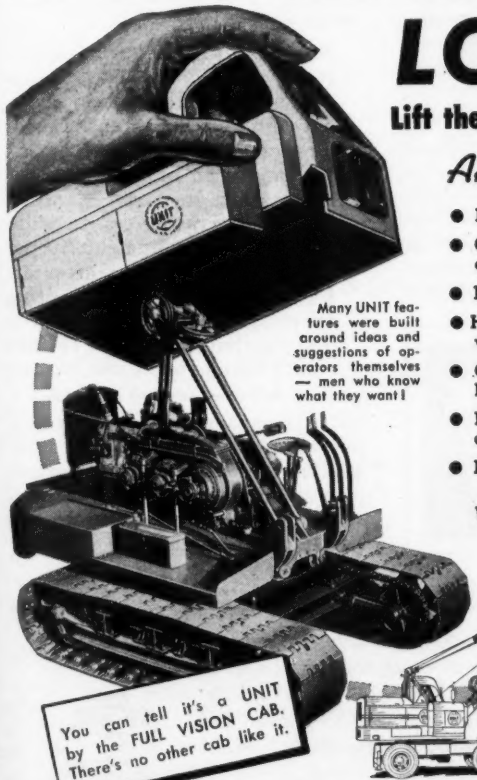

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You can tell it's a UNIT by the FULL VISION CAB. There's no other cab like it.

Convertible to ALL ATTACHMENTS
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Clamshell
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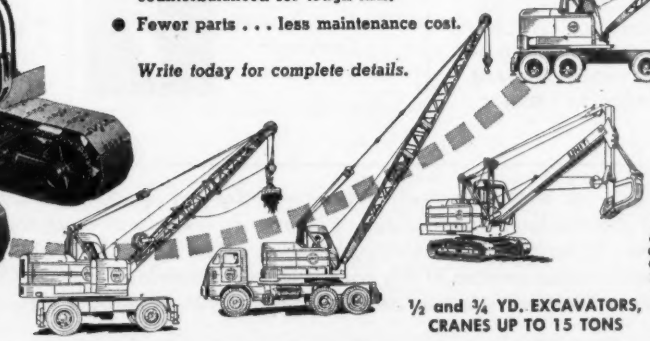

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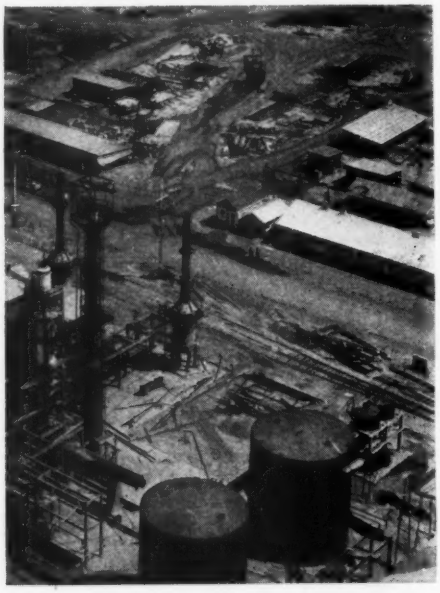
NUMBER 6 IN A SERIES

Home office accounting discloses many opportunities for savings in field construction!



A field office has certain minimum requirements regardless of whether the labor force totals 50 or 1000. Office managers, chief clerks, timekeepers, payroll clerks, messengers are the human quotient—time clocks, comptometers, telephone lines, staff cars, paper forms, postage are the inanimate expense items. Where more than one contractor is engaged on a refinery site, *each* must employ such help and rent or buy such equipment for his own and his customer's protection. While at first glance the duplicated costs may seem small in relation to the overall outlay for labor, they can appreciate to interesting sums. For instance, a saving of only $20,000 over the period of a year could represent the refiner's earnings on two million gallons of gasoline.

The quality of technical supervisory personnel assigned by various contractors must also be included as a factor in savings under the "master" contract type of operation. It is a matter of common sense that a contractor can only afford a quality of personnel *proportionate to the income derived from the job.* Under the "master" contract the income to the selected *single* contractor is naturally greater than any share of such income derived from one of several contracts. The actual dollar relationship of quality of personnel to costs is, of course, undefinable. But anyone experienced in construction knows that quality of supervision *is* a *prime* factor in determining ultimate costs.

Then there are such items as *"temporary structures at site"* which appear on all cost sheets and on many of them reach sizable sums. When you consider that a large, temporary craft-building may bear a price tag today of some $10,000, it should certainly be to a refiner's advantage to keep the number of such buildings to an irreducible minimum—through confining the same crafts at any refinery site to the same facilities. Further, a similar reduction in other "temporary structures"—warehouses, toolrooms, field offices, etc., also representing good-sized dollar expenditures—builds the possible savings on this one item to truly interesting proportions.

D. J. OLSEN
Comptroller
The M. W. Kellogg Company

And in *construction tools and equipment* alone, there is an opportunity to effect major economies through the concentration of all work to be done on any refinery site in one contractor's hands. For just one example, heavy-duty crawler cranes, without operators, rent for $250 per day. If a crane should remain idle for only two hours a day, waiting for lifts, when it could be busy at another battery site, a refiner would have to sell a tank car full of gasoline to recoup the loss.

These potential savings plus the economies in field labor, discussed in a previous advertisement, when taken in toto, deserve the serious consideration of every refiner undertaking new construction or modernization of existing facilities.

Our company—M. W. Kellogg—is completely staffed and equipped for refinery and chemical plant design and construction, from the step of laboratory research through the initial operation of completed plants. It periodically issues a publication called the KELLOGGRAM, which describes many of these services. If you are not already receiving it, we will be glad to add your name to the list if you will drop us a line at 225 Broadway, New York 7, N. Y.

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A SUBSIDIARY OF PULLMAN, INC.

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Cost-imating

A WEEKLY FEATURE OF THE OIL AND GAS JOURNAL

Lumber

TENTATIVE SCHEDULE OF TOPICS

Current subjects of the new Cost-imating Series are tentatively:

No. 1—Oct. 21—Construction-Cost Indexes
No. 2—Oct. 28—Exchangers
No. 3—Nov. 4—Construction Steel
No. 4—Nov. 11—Use of Cost Indexes
No. 5—Nov. 18—Storage Tanks
No. 6—Nov. 25—Petrochemical and Small Tanks
No. 7—Dec. 2—Lumber
No. 8—Dec. 9—Summary Sheet of Costs
No. 9—Dec. 16—Vessels
No. 10—Dec. 23—Vessels (continued)
No. 11—Dec. 30—Fractionating Towers

The main uses of lumber in the refinery are:

1. Forms for concrete construction.
2. Scaffolding, for working on piping or equipment, and applying insulation or paint.
3. Wood tanks.
4. Cooling towers.
5. Frame buildings or sheds.

Cost values used by some estimators for lumber is indicated in Table 1. The common basis for lumber costs is the "board foot" which is defined as 1 sq. ft. 1 in. thick, and the abbreviation commonly used is M.f.b.m. for 1,000 ft. board measure, or f.b.m. for 1 sq. ft. board measure. Another term used for area is the "square" which is 100 sq. ft. or a 10-ft. by 10 ft. square. The erection cost of wood tanks ranges from 40-60 per cent of the material cost of large tanks (2,000 f.b.m. or larger), up to 60-100 per cent for small tanks (500 f.b.m. or smaller).[3] The lumber used for tank construction is almost the best grade of lumber that is available. It must be entirely free from flaws, knots, checks, etc. The cost of "take down" and "reset" in 1946 ranges from about $120 for small tanks (200-bbl.) to $180 for larger tanks (700-bbl.).

LUMBER INDEXES (APPROX.)‡ 1946 = 100

Year	Composite lumber	Douglas fir	Southern pine	Oak	Maple	Refinery† labor
1926	55					58
1928	51					57
1929	53			*75	*61	59
1930	48					57
1931	39					57
1932	33		*36	*52	*32	48
1933	40	*38				49
1934	47	*47				55
1935	46	*45	*46		*50	58
1936	49	*52	*50	*53	*53	60
1937	56	*55	*52	*52	*63	65
1938	49	*47	*51	*63	*57	67
1939	52	51	49	49	*51	68
1940	58	57	55	53	*53	69
1941	69	68	68	63	*65	71
1942	75	83	67	68	*71	79
1943	79	84	73	78	*77	87
1944	86	86	80		*85	90
1945	87	86	86	82	*87	94
1946	100	100	100	100	*100	100
1947	155	164	152	148		119
1948 est.	173	185	168	163		154

***Approx.—from Statistical Abstracts of the U. S. Department of Commerce. †Industrial Report—Lumber, Forest Products Section, U. S. Department of Commerce, Office of Domestic Commerce. ‡Cost-imating No. 1, October 21, 1948, page 141.**

References

1. Author's files.
2. Ind. Eng. Chem., 28, 176 (1936).
3. Bliss, H., Chem. Engineering, May 1947, p. 126.

TABLE 1—COSTS OF SOME TYPES OF LUMBER CONSTRUCTION (1946)

Lumber—	Unit	Material	Labor	Reference
Scaffolding:				
Towers, or above 20 ft.	$/M.f.b.m.	113	85	(1)
Pump houses, pipe stills or below 20 ft.	$/M.f.b.m.	85-94	93-102	(1)
Forms for concrete:				
On ground	Cts./sq. ft.*	*10	26	(1)
Roof beams	Cts./sq. ft.*	*23	12	(1)
Walls	Cts./sq. ft.*	*20	11	(1)
Framing	$/M.f.b.m.	82	40	(1)
Siding	$/M.f.b.m.	133	71	(1)
Shingles, red cedar	$/square	97	30	(1)
Tank stock:				
Oak	Cts./f.b.m.	†56-75		(2)
Cypress	Cts./f.b.m.	†53-74		(2)
Redwood	Cts./f.b.m.	†47-63		(2)
Fir	Cts./f.b.m.	†40-56		(2)
Pine, yellow	Cts./f.b.m.	†24-50		(2)
Juniper (Virginia white cedar)	Cts./f.b.m.	†24-45		(2)

***Each square foot of form requires much auxiliary framing. †Including hoops and hardware. Galvanized hoops costs 8 per cent more.**

No. 7 in a series by W. L. Nelson, professor of petroleum refinery engineering, University of Tulsa

Hancock design "obsoletes" seat inserts

SUPER-HARD *Stellite* faced seating surfaces in Hancock GateValves are integral with the WELDVALVE body. They never need to be replaced, and leakage between body and seat is impossible.

The Hancock technique of accurately finishing before assembly, assures perfect alignment with the "500 Brinell" stainless steel wedge, and results in complete absence of distortion inherent in screwed-in and spun-in seat designs.

Excess handwheel pressure to align seating surfaces is not necessary for WELDVALVE tightness. *Perfect* alignment guarantees tight valves even on the upstream side of the wedge.

Designed for 800# at 750°F or 2000# at 100°F. Sizes ¼" to 2" inclusive.

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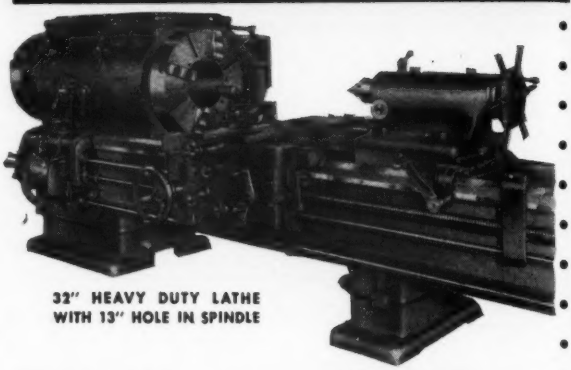
LARGE HOLLOW SPINDLE TYPE



32" HEAVY DUTY LATHE
WITH 13" HOLE IN SPINDLE

"Its Precision Machining Satisfies Our Closest Tolerance Requirements"

...SUPERIOR TOOL CO.

THE SUPERIOR OIL TOOL CO., Santa Fe Springs, Calif., recently wrote us: "Since its installation, 2½ years ago, our 27" Hydratrol Lathe has been operating 2 shifts per day, 6 days a week, cutting tapered tool joints in Drill Collars.

"These Drill Collars are 40 ft. long and 4½ to 10" in diameter. Frequently as many as 6 are screwed together to run directly above the drilling bit in a drill pipe string; therefore, accurately machined joints are a 'must'.

"Many of the Oil Companies maintain their own joint inspection departments, equipped with precision instruments to check lead, taper and fit, to insure against failure in operation and costly fishing jobs. We have been able to satisfy their closest tolerance requirements on tool joints and have an increasing clientele as a result."

5 Sizes—18" to 36". Also Standard Hydratrol Lathes (Heavy Duty), Sizes 16" to 36"

LEHMANN *Machine Co.*
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No. 354

Boyle's Law for Spherical System

THE commonly used geometrical configurations for calculating the flow of fluids in porous media are the linear system and the radial system. Another system of some possible applicability is the spherical system. Such a system might be closely approached where a producing formation was of a thickness approximately half the distance between wells and where the formation was penetrated for only a short distance comparable to the total pay thickness. This latter condition could arise where coning of bottom water was important. Fig. 1 illustrates the condition showing spherical flow lines. The present discussion will give Darcy's law for such a system flowing a homogeneous liquid.

Consider a differential increment of the system as the volume between two concentric spheres of radii r and r + dr. Refer to Fig. 2. At a point in this increment the differential form of Darcy's law is written as:

$$v = \frac{k}{\mu}\frac{dp}{dr} \qquad (1)$$

Since dp and dr are measured in the same direction the ratio is positive and no change of sign is necessary.

The velocity is given as rate of flow divided by cross-sectional area, or:

$$v = \frac{Q}{A} \qquad (2)$$

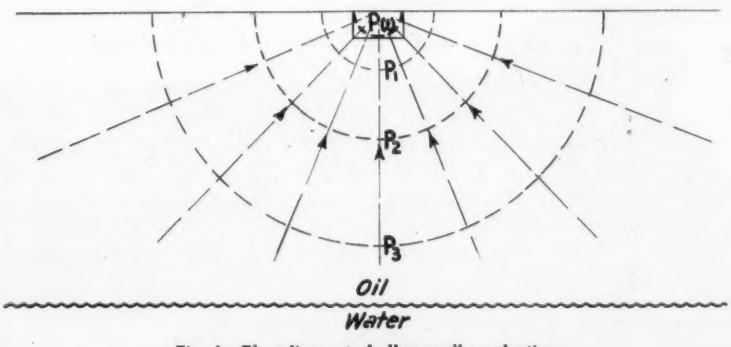


Fig. 1—Flow lines at shallow-well production

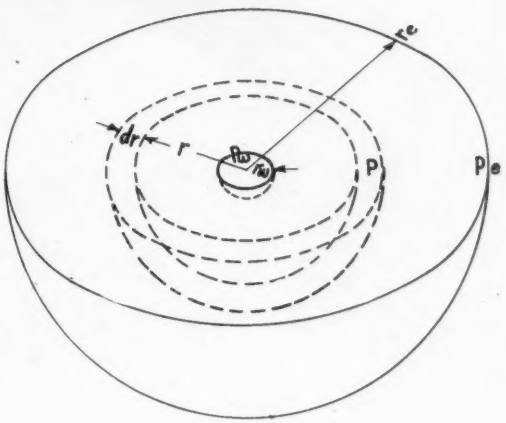


Fig. 2—Spherical system

In this particular case the cross-sectional area is the surface of the sphere of radius r, which is:

$$A = 4\pi r^2 \qquad (3)$$

Therefore:

$$\frac{Q}{4\pi r^2} = \frac{k}{\mu}\frac{dp}{dr} \qquad (4)$$

The variables can be separated and the equation integrated, thus:

$$\frac{Q}{4\pi}\int_{r_w}^{r_e}\frac{dr}{r^2} = \frac{k}{\mu}\int_{P_w}^{P_e} dp \qquad (5)$$

$$\frac{Q}{4\pi}\left(\frac{1}{r_w} - \frac{1}{r_e}\right) = \frac{k}{\mu}(P_e - P_w) \qquad (6)$$

Inasmuch as the system outlined in Fig. 1 is only half a sphere rather than a full sphere, the formula for the rate of flow would be one-half that derived. Thus:

$$Q = \frac{2\pi k (P_e - P_w) r_w}{\mu\left[1 - \left(\frac{r_w}{r_e}\right)\right]} \qquad (7)$$

The quantity r_w/r_e is a small fraction, and as a first approximation it would be neglected. This indicates that the rate of flow is directly proportional, therefore, to the well radius, and that the rate of flow is insensitive to changes in the pressured radius.

For a compressible fluid the derivation is modified only slightly, by using PQ = a constant for the compressibility variation. This gives as a result the usual difference of pressures squared. The equation is:

$$Q_m = \frac{2\pi k (P_e - P_w) r_w}{\mu\left[1 - \left(\frac{r_w}{r_e}\right)\right]} \qquad (8)$$

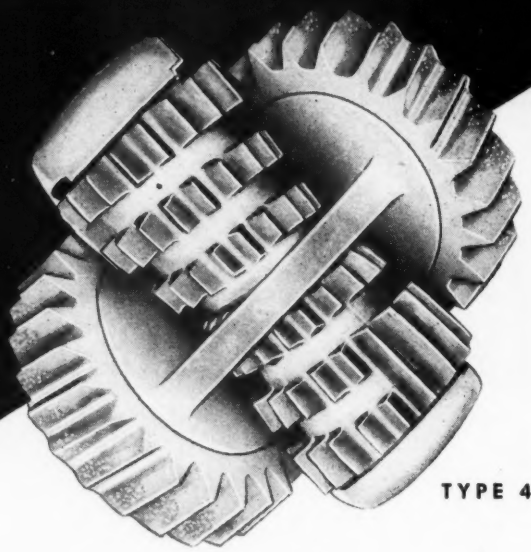
where Q_m is now the rate of flow measured at the mean pressure:

$$P_m = \frac{P_e + P_w}{2}$$

Nomenclature

- v = velocity
- μ = viscosity
- A = area
- k = permeability
- P = pressure
- r = radius
- Q = volume rate of flow
- e = subscript for edge conditions
- w = subscript for well conditions
- m = subscript for mean pressure conditions.

Series by Dr. John C. Calhoun, Jr., Chairman, Petroleum Engineering School, University of Oklahoma



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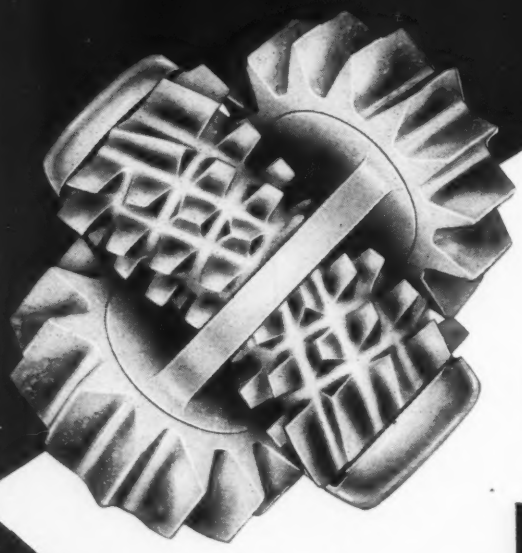

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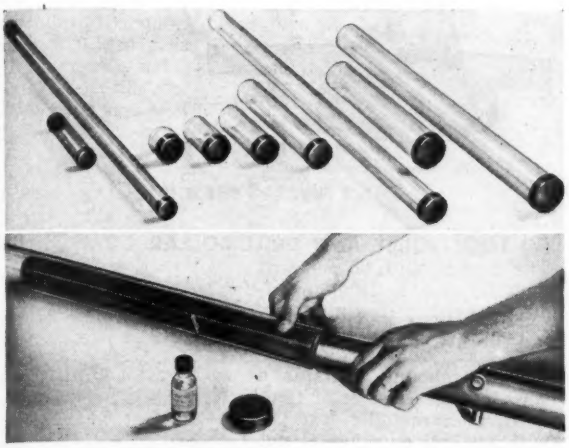
OIL AND GAS EQUIPMENT Digest

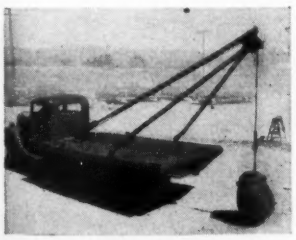
IT'S NEW ✓ CHECK IT

by Craig Espy



(1) EXTRULITE CORE TUBES protect cores against all possible damage. Tubes are made of clear, oil, gas and waterproof plastic and are supplied in any specified length. They are made in diameters from 1 to 3 in., in ¼-in. increments. A special tube 1⅜-in. diameter by 7 is supplied for "sidewall" cores. Tubes are closed at each end with fabricated plastic caps. One cap is applied at the factory and is made a permanent part of the tube by a solvent, compounded for this service. The second cap is a snug fit, furnished with the tube, to be sealed by the operator. Solvent, in bottles with a brush applicator, is supplied so that operators can seal containers. When sealed, container must be cut to "get at" contents. The container is transparent; therefore, a tag inserted before sealing can be read from the outside. *Extruders, Inc.*

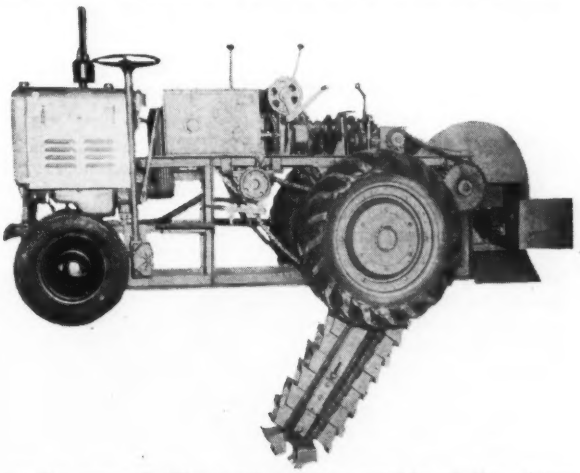
IT'S NEW ✓ CHECK IT



(2) TRUCK-MOUNTED "A" FRAME. Provides a safe, efficient means of hoisting loads on or off any flat-bed truck. Can be operated by one man throughout the full procedure of picking up, loading, transporting, and unloading. Frame consists of two steel side legs supporting a slideable center-leg assembly. As the load is winched vertically, the sliding tube remains extended until contacted by a winch-line socket. Further pull causes the tube to slide down a hinged mandrel to compress a heavy coiled spring in a cylinder at the base of the mandrel. This swings the load being winched over the truck bed. The mandrel and sliding tube are locked by inserting a pin through matching slots of the tube and mandrel. The load can then be lowered onto the truck bed for transporting. *Paul F. Blackman Manufacturing, Inc.*

IT'S NEW ✓ CHECK IT

(3) MOBILE DITCHER, which "rips" a ditch, features an entirely new design in boom and bucket line. The harder the digging, the greater the pull on the machine



to the ground. The teeth on the outside of the digger shave off chips of earth which fall loosely to the bottom of the bucket and are expelled when the buckets turn over the upper sprocket. Mud that adheres to the teeth

The Oil and Gas Equipment Digest presents a review of what is new in equipment and trade literature . . . makes it possible for readers to obtain full information on every subject by use of convenient "Check It—Mail It" service card. This periodic feature of The Oil and Gas Journal will include all that is new in equipment . . . at a time when new products are being introduced, and existing products improved.

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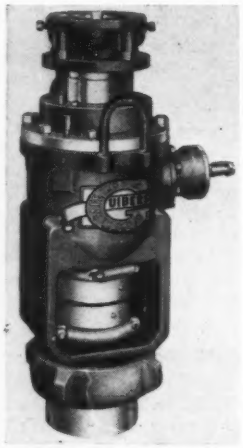
is forced off by the next cycle of revolution. This presents self-cleaning feature by which it can operate in the most gummy soil. Hip action of the rear wheels enables the ditcher to level up and dig a vertical ditch on a lateral slope up to 30 per cent. Each rear wheel is independently adjustable 6 in. up or down from center. One wheel can run on a level 12 in. above or below the other and still dig a vertical ditch without undercutting. *Longhorn Industries, Inc.*

IT'S NEW CHECK IT



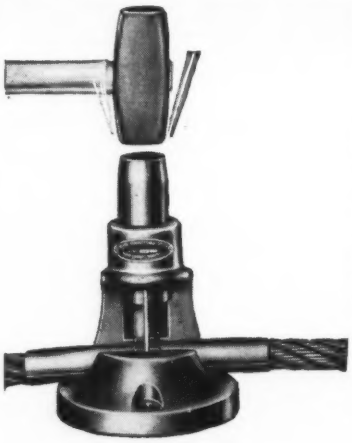
(4) NEW ROTATING DRILLING HEAD is said to include many improvements over other models. Wash-pipe packing assembly, contained in the head, is full-floating in action. It rotates in either or both of two independent packing glands. This action relieves wear, and adds to the life of the wash-pipe. It also reduces packing deterioration. The assembly can be quickly and easily removed for servicing without dismantling the head. Each drilling head is available with a spare assembly, so that operator can replace it with standby and return the worn part to the manufacturer. The head is constructed to handle tubing strings up to 8,000 ft., in 2, 2½, and 3-in. sizes. *The Guiberson Corp.*

IT'S NEW CHECK IT

(5) NEW ROLLER-CHAIN FASTENER. The abuse under wnich chains must operate often causes fasteners to be bent, sheared off, or dislodged, resulting in a shutdown and exposing workman to injury. New fastener, a unique type of retaining ring, is provided with three internal, equally spaced teeth, sprung radially into a groove on the pin. The mathematically predetermined, equal spacing of teeth, and spring action of connecting links, assure that the ring will maintain a tight groove tension at all times. When struck by a direct blow, it merely turns in its groove, hugging it tightly. Even if blow should come from unlikely angle or shape that would tend to shear, the retaining ring has a greater shear area than most conventional fasteners. *Atlas Chain & Manufacturing Co.*

IT'S NEW CHECK IT

(6) WIRE-ROPE CUTTER requires only 10 seconds to cut wire cable clean and smooth with no jagged or frayed ends. Optional cable band, with lock seam for each size cable, grasps wire holding strands in place when severed. This preserves original roundness of rope. Tool has patented precision engineered cutting blade. No special skill is required in the easy operation of the cutter. Number 1 tool is designed to be carried in kit bag for cutting rope on the job. *Morse - Starrett Products Co.*



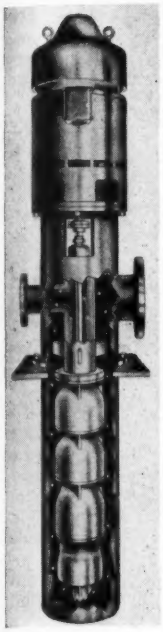
IT'S NEW CHECK IT

(7) TOOL-JOINT AND DRILL-COLLAR COMPOUNDS. The former, with 60 per cent metallic zinc, is recommended for getting maximum efficiency and long-life from new tool joints. The drill-collar compound contains a very high percentage of finely divided metallic lead. It will not gall or seize; is not affected by contraction, expansion, vibration, or temperature changes. *Standard Oil Sales Co.*

IT'S NEW CHECK IT

(8) DEMPSTER DIGGSTER fills the need for a small shovel-loader unit capable of handling large and small jobs alike. Said to be the only small shovel that works on a hydraulic crowd and hoist principle, it travels at truck speeds on the open road. Its ability to dig 15 in. under the grade, or 15 ft. above the grade means that it can complete most excavating jobs alone. On unusually large jobs, it gets into tight places and frees big shovels for heavy work. All points of stress and strain are reinforced. Axles and bearings are Timken made and brakes are the hydraulic type for quick stopping and positive holding. Dumping reach of 10 ft. 6 in. permits even distribution of loads in largest trucks. Heavy-duty dipper has hard-steel teeth. Stock-pile loading buckets for loose material available in 1¼, 1½, and 2-cu. yd. capacities. *Dempster Brothers.*

IT'S NEW CHECK IT



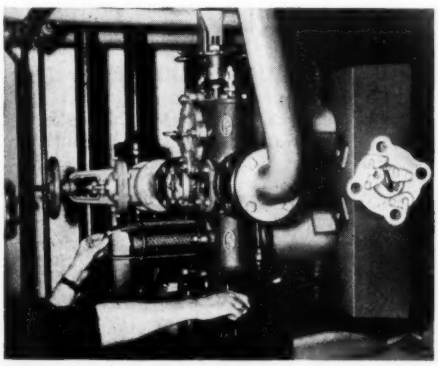
(9) VMT PUMPS are designed for use where net positive suction head is limited. Will handle liquids, hot or cold, corrosive or noncorrosive. Multi-stage vertical pumping unit is mounted in a barrel from which it takes suction. Base of pump is ground level. Arrangement permits pumping from suction vessel set at lower elevation than the pump. Standardized in four sizes with 8, 10, 12, and 14-in. barrels. Sizes cover capacities to 1,000 g.p.m. Larger sizes furnished to 5,000 g.p.m. *Byron Jackson Co.*

IT'S NEW CHECK IT

(10) TURBINE IMPELLER-TYPE SINGLE-STAGE PUMP. High - pressure, noncorrosive pump is simple in design having a minimum number of parts. Only moving parts are a stainless-steel shaft and bronze hard chrome impeller. The pump housing is not subject to wear as parts do not come in contact with each other. Also features ball-bearing operation. High pressure develops on single stage at 3,500 r.p.m. Under actual tests the pump handled at 90 lb. pressure, 3 g.p.m., total head in feet 200. *Frank Mathey Machine Works, Inc.*

IT'S NEW CHECK IT

(11) DISK-TYPE DUPLEX STRAINER is designed to handle fluids with a high solid content without the necessity of interrupting pipe-line operation to clean the strainer.



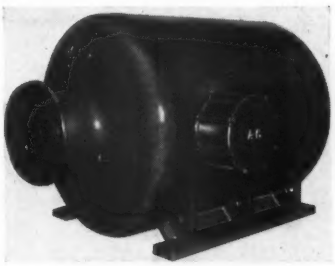
Units are suitable for intermittent as well as continuous flow. Flexibility of design permits the handling of sudden surges of solids. Flow through the unit is diverted from one straining chamber to another by a large, easily operated handwheel without the possibility of any positive shutoff. While flow passes through one straining chamber, the other may be cleaned. Covers are removable for lifting out the perforated strainer baskets. Strainer is adapted to high open-area ratio and is suitable for a wide range of pressures and temperatures. Valve seats are removable and valve stems are supported at both ends for accurate permanent alignment. *J. A. Zurn Manufacturing Co.*

IT'S NEW CHECK IT

(12) BUBBLER METER. Gas or liquid purge rates are measured in familiar flow units (i.e. cubic feet per hour of air or gallons per hour of water) by new purge service flowmeter. An adaptation of the Flowrator instrument, it includes a built-in needle valve for close control of purge rates. It covers the range of measurement generally accepted as standard for bubbler installations. Unit consists of a Pyrex or stainless - steel ball - shaped float, a precision-bore Pyrex metering tube and a die-cast body which houses the needle-type control valve. *Fischer & Porter Co.*

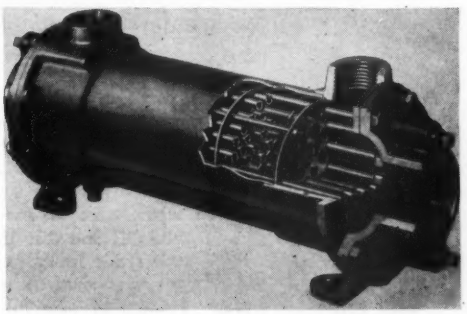
IT'S NEW CHECK IT

(13) TUBE-TYPE, TOTALLY ENCLOSED, FAN-COOLED, SQUIRREL - CAGE MOTORS. New motor is divided into two isolated parts with each side having its own path of internal air circulation. Because of construction, it is possible, through simple maintenance, to keep motor free of power-destroying agents which tend to clog air passage. New line offered with Underwriters' labels for 1-D or 2-G locations in rating of 3,600 r.p.m., 250 to 400-hp.; 1,800 r.p.m., 200 to 300-hp., and 1,200 r.p.m., 150 to 200-hp. *Allis-Chalmers Manufacturing Co.*



IT'S NEW CHECK IT

(14) REDESIGNED EXCHANGERS. Are now mass produced and carried in stock. Said to be the first shell-and-tube exchanger to be carried in stock as shelf goods,



these light-weight nonferrous units are based on the service records of 150,000 similarly built exchangers. Research has enabled manufacturer to determine the

design features, sizes, and capacities in greatest demand, to standardize them and place them into mass production. For diesels, gas engines, compressors, blowers, and many other applications, manufacturer claims to have achieved the lowest cost per B.t.u. transferred. *Ross Heater & Manufacturing Co., Inc.*

IT'S NEW ✓ CHECK IT

TRADE LITERATURE

(15) FIRST EDITION NEW LUBRICATED PLUG-VALVE CATALOG. Sixteen pages, amply provided with dimensional drawings, tables, and descriptive matter. Features a full-page cross-section view of valve giving clear description of its advantages. *H. K. Porter Co., Inc.*

(16) NEW FREE-MACHINING ALLOY STEEL. Bulletin describes new free-machining alloy steel said to develop hardness comparable with that of A.I.S.I. 4150 S.A.E. 4150. Reports savings of 25 to 50 per cent in machining time compared with standard alloys. Gives analysis and mechanical properties. *Joseph T. Ryerson & Son, Inc.*

(17) LAMINATED PHENOLIC TUBING. Engineering bulletin describes advantages of tubing for above or underground installations handling oil, gas, alkali, salt water, etc. Lists superior advantages including low first cost. *Black Supply Co.*

(18) RESEARCH. Bulletin discusses instruments for automatic control of specific gravity under heading of new problems, new applications, new apparatus. Flow charts shown. *The Refinery Supply Co.*

(19) FLUID PROGRESS. Thirteen foldout pages graphically illustrate how fluid "Cats" set pace for Cat-Cracking industry. Presents chronological photographic listing of complete family of 42 Kellogg cat crackers. *M. W. Kellogg Co.*

(20) NEW AIRCOMATIC WELDING PROCESS. Six-page folder entitled "The Development of the Gas Shielded Metal Arc Welding Process" gives complete details and description of new process introduced at National Metal Exposition. *Air Reduction Sales Co.*

(21) NORMA-HOFFMANN CARTRIDGE BALL BEARING. Twenty-eight pages cover in complete detail many engineering features of "Cartridge" ball bearing. In addition, gives various mounting recommendations and data regarding service life and lubrication. *Norma-Hoffmann Bearings Corp.*

(22) A.C.F. PLUG VALVES. Thirty-six-page catalog fully describes and illustrates line of valves and presents information on accessories. Amply illustrated with pictures, sectional drawings, data tables. *American Car & Foundry Co.*

IT'S NEW ✓ CHECK IT

(23) WISCONSIN HEAVY-DUTY AIR-COOLED ENGINES. There are 177 action photographs showing use of engines and plant facilities published in 56-page catalog. Preamble gives history of progress of engine manufacture. *Wisconsin Motor Corp.*

(24) PNEUMATIC TRANSMISSION. Data Book contains complete up-to-date information on pneumatic transmitters and their application to the measurement of flow, level, pressure and density. *Republic Flow Meters Co.*

(25) DRAW WORKS. Twenty-four pages give complete descriptions of two steam-driven draw works. Both types are heavy units of powerful construction, incorporating many original and distinctive features. Profuse illustrations. *National Supply Co.*

(26) FACTS FOLDERS ON FOUR CRAWLER TRACTORS present design and performance details. Profitable work applications of each are spotlighted in job shot illustrations. Sectional views reveal engineering construction details. *International Harvester Co.*

(27) ADJUSTABLE BELL JOINT CLAMP. Twelve-page booklet describes clamping as the right practice and illustrates eight opportunities to save time, money, and trouble by using clamps. Shows steps in installation. *Dresser Manufacturing Division.*

(28) QUICK COUPLINGS. Twenty-page catalog contains engineering data and specifications on quick couplings, caps, coupling-valves and related products. *Roylyn, Inc.*

(29) THE STORY OF THE TIRE. Sixty-eight-page booklet answers many questions about where rubber comes from, how synthetic is manufactured, and what is some of the research back of development. *Goodyear Tire & Rubber Co.*

(30) BACKLIGHTED MULTIPLE TUBE MANOMETER. New bulletin describes new 82-tube, 62-in. range manometer used at 125-lb. pressure. It is backlighted for photographic record and study. Diagram of various mountings graphically shown. *Trimount Instrument Co.*

(31) HIGH-TEMPERATURE INSULATION. Twenty-four pages about high-temperature insulations. Charts given on conductivity and installation of both plastic and block insulations; also data on pipe covering insulations. *Forty-Eight Insulations, Inc.*

(32) OIL-COUNTRY PUMP-SELECTION GUIDE. Twenty-four-page, pocket-size handbook presents information on four basic types of oil-country pumps. "Which Type for the Job" is the heading under which data are presented. *Marlow Pumps.*

(33) TORQUEMETER BULLETIN. Covers four standard, and specially designed torquemeters. Tells how to specify requirements and shows how torquemeter works. *Baldwin Locomotive Works.*

IT'S NEW ✓ CHECK IT

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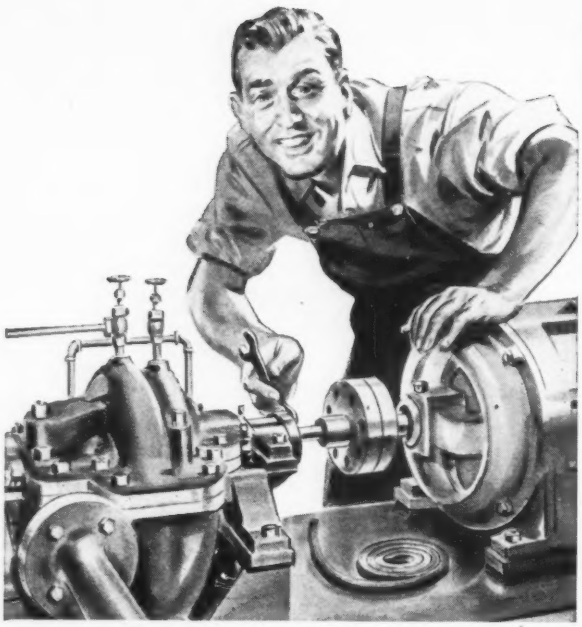

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GARLOCK 732 patented Lattice-Braid—with wire

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REFINING

Continental's Plant in Denver Goes on Stream

ALMOST doubling its capacity, Continental Oil Co.'s Denver, Colo., refinery has just gone "on stream" after virtual completion of a $5,800,000 enlargement program that was launched in June 1947. *(For picture of plant's new facilities see page 39, this issue.)*

Enlargement has increased the Denver plant from a daily crude processing capacity of 3,500 bbl. to 6,750 bbl. It has been made flexible in design to handle the wide variety of crudes available in the Rocky Mountain region. The new design incorporates catalytic cracking, a new vapor recovery and gasoline stabilization unit, catalytic polymerization, and enlarged liquefied petroleum gas facilities in addition to the existing facilities.

Enlargement of crude-topping equipment was necessary as a part of the expansion program. Maximum utilization was made of the existing two-coil thermal cracking unit for thermal reforming of low octane naphtha and thermal cracking of catalytic cycle gas oil. The catalytic cracking unit, the first to be installed in any Colorado refinery, will have a reactor charge capacity of 6,600 bbl. a day.

Most of the crude oil processed in the plant will come through Rocky Mountain Pipe Line Co.'s system from Fort Collins, Wellington and Rangely areas in Colorado and from Lance Creek and Horse Creek areas of Wyoming.

Denver is the "hub" of Continental's operations throughout the Rocky Mountain region where they have production, manufacturing and marketing interests.

Sunray Will Double Crude Runs and Products in 1948

Sunray Oil Corp. refineries will more than double the amount of crude oil processed in 1948 over 1947, at present rates of runs to stills. It is currently running about 34,500 bbl. of crude daily to stills at its three plants, an amount approximately equivalent to its net crude production.

Sunray officials say that completions this year are well ahead of 1947 completions, and that new crude gathering lines extending into Stephens and Carvin counties, Oklahoma, are being completed to serve its catalytic cracking unit at Duncan.

New Manufactured Gas Method Uses Heavier Oil

A NEW method for making manufactured gas of a heat content equivalent to natural gas, entirely from low-cost, heavy oils, has been announced by the American Gas Association. The new economical process has been developed under a research program conducted by the association and is the invention of Edwin L. Hall, director of the American Gas Association testing laboratories at Cleveland and Los Angeles.

Through the use of cheaper grades of oil, the new process makes possible a reduction of 30 per cent or more in the cost of gas-making materials and an increase in thermal capacity of approximately 35 per cent in existing apparatus.

Present oil-gas processes are unable to employ the cheaper, heavier oils successfully because their larger carbon content fouls generators, reducing capacity and resulting in expensive time and heat loss.

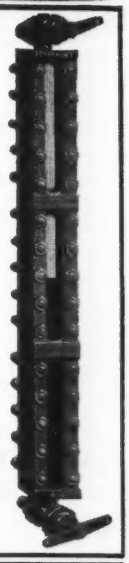
In the new process, however, the coke deposit is burned off during the gas-making period and supplies a good portion of the heat necessary for gasifying the heavy oil without requiring any additional time. Thus the gas-making capacity of the plant is considerably increased.

Using converted units of former water-gas sets, the Consolidated Gas Electric Light & Power Co. of Baltimore was able to produce about 6,000,000 cu. ft. of 1,000 B.t.u. gas per using premium oil costing about 12 day from a single converted unit cents per gallon. Using a lower grade Bunker C oil costing about 6.5 cents per gallon, the same unit produced approximately 5,000,000 cu. ft. a day. Apparatus employed in the new process can be made at 50 to 60 per cent of the cost of conventional type water-gas equipment.

Cracking Unit Planned for Wichita Falls Refinery

Plans for the installation of a catalytic cracking unit, at an approximate cost of $1,000,000, by Panhandle Producing & Refining Co. at its Wichita Falls, Tex., plant were disclosed this week in a joint announcement by

PENBERTHY
"REFLEX"
DROP FORGED STEEL
LIQUID LEVEL GAGES



Liquid always shows black—empty space shows white. Preferred where the liquid level must be easily and positively visible, and when liquids are under high pressure or at high temperature. Made of alloy temperature resisting steel and are highest quality throughout. Liquid chamber made from solid block of steel to assure perfect alignment and rigidity. Conform with A.P.I.—A.S.M.E. requirements.

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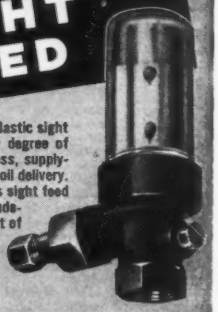
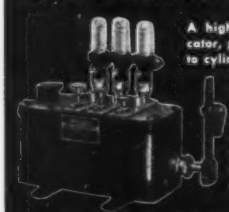


McCORD "SF" LIQUID SIGHT FEED LUBRICATORS



A highly developed lubricator, particularly adapted to cylinder and bearing lubrication. Features: Precision built, most flexible and positive oil delivery system known. Supplied in 1 to 24 feeds. Specify McCord "SF" Lubricator.

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Branch Offices: Denver, Dallas, New Orleans

John V. Boyce, president, and R. C. Stanford, vice president, Houston, and W. F. Sims, refinery manager.

The new cat cracker, first in North Texas, will increase the refinery's crude-oil capacity from 4,000 to 6,000 bbl. daily. Present cracking capacity is listed as 1,500 bbl. daily.

Contracts have been let with Universal Oil Products Co. and the Jones & Laughlin Supply Co. for engineering work on the new unit. Jones & Laughlin will handle erection of the towers, reactors, pipes and buildings, although all the structural steel and vessels for the plant will be fabricated and constructed in Panhandle's own steel products shops, it was said.

According to Sims, engineering details are expected to be completed by March at which time actual construction will be started. He estimated it would take a year to complete the project and the first runs will probably be made in March 1950.

Operation of the unit is to be practically automatic, being run by electronic controls from a central board.

Carter Sells Lovell, Wyo., Plant to Husky Refining

Announcement has been made of the sale of Carter Oil Co.'s 2,000-bbl. refinery at Lovell, Wyo., to Husky Refining Co. The plant has been operated by Carter since 1944 when they purchased it from Yale Oil Corp. Originally built to process crude from nearby fields, the refinery was shut down when supplies dwindled but was reopened in 1939 when Yale purchased it.

Carter officials stated that the company disposed of the plant because other Carter refineries could supply sufficient products to care for the company's demand during the coming winter and that their new 20,000-bbl. plant now under construction at Billings, Mont., would be completed in time to meet the heavier requirements in 1949.

In addition to the plant, a short gathering pipe-line system, product inventories, and warehouse stocks on hand were included in the sale.

Carter operates other refineries at Newcastle, Wyo.; Billings, and Cut Bank, Mont. Husky also operates a 5,000-bbl. refinery at Cody, Wyo., and a 5,000-bbl. plant at Lloydminster, Saskatchewan, Canada.

Ethyl Increases Price Of Anti-Knock Compound

Ethyl Corp. has notified its customer companies that because of higher costs for metallic lead and other materials used in manufacture of its products, an increase of approximately 7 per cent in the selling price of Ethyl anti-knock compound will become effective February 1, 1949.

This increase will bring the price to 63.32 cents per pound of tetraethyl lead content for motor mix (approximately 0.23 cent per cc. and 68.72 cents per pound of tetraethyl lead content for aviation mix (approximately 0.25 cent per cc.).

Company officials pointed out that the posted price for metallic lead had risen on November 1 from 19.5 cents to 21.5 cents per pound.

Shell Wins Chemical Award

Shell Development Co., research affiliate of Shell Oil Co., Inc., has been given an award for chemical engineering achievement for having produced glycerin synthetically for the first time in commercial quantities.

CURTIN CENTRIFUGES

GIVE YOU QUICK, ACCURATE RESULTS WITH LESS EFFORT . . . AT LESS COST

Simple in design, ruggedly built for heavy duty service. Gear ratio and throw of crank produce required speed with no strain. Heads and cranks of 100 CC and 15 CC machines are interchangeable. Meets *A.S.T.M. Standard Method D-98* and *A.P.I. Code No. 25 requirements.* Ask for full details.

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stop razing the roof because of sour crude corrosion

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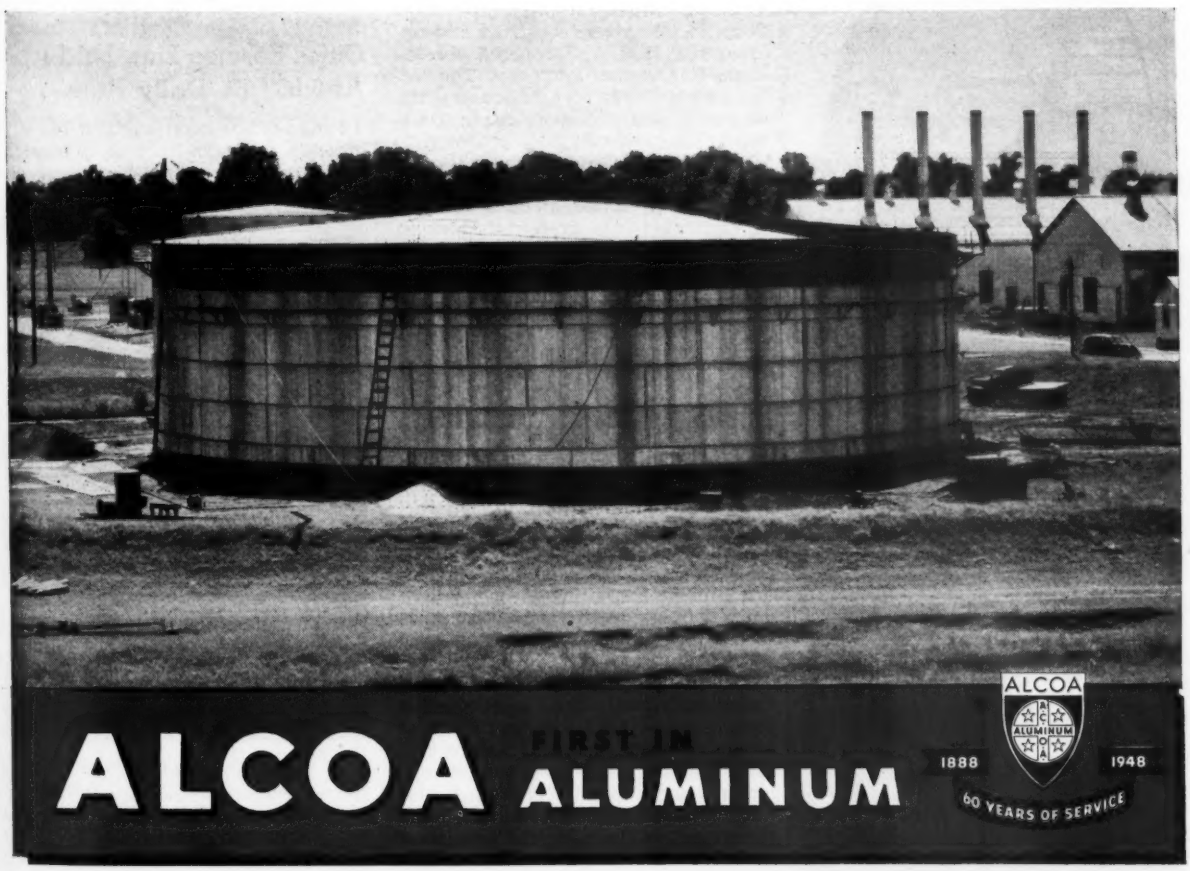
Make tank roofs last 3 times as long. Install a roof system of Alcoa Aluminum Plates and Girders. Save the expense and inconvenience of draining tanks to replace rusted-out heavy-metal roofs. Aluminum has high resistance to attack by sour crude fumes and water vapor that collects under tank roofs.

The naturally bright aluminum surfaces stay bright even after years of exposure to weather and refinery fumes, give you extra savings by reflecting sunlight. Aluminum is easy to fabricate, easy to erect because of its light weight.

Whether you're replacing roofs or ordering new tanks, specify Alcoa Aluminum for the roofs. For engineering advice and data, call your local Alcoa Sales Office. Or write to ALUMINUM COMPANY OF AMERICA, 1928 Gulf Building, Pittsburgh 19, Pennsylvania.



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PIPE LINES

Trans-Continental Gets Approval for Bigger Line

WASHINGTON. — Anticipating future increases in demand, Trans-Continental Gas Pipe Line Co., Inc., last week secured authority from the Federal Power Commission to use 30-in. instead of 26-in. pipe in 1,210 miles of its 1,840-mile pipe line to be built from Texas to New York City.

The larger pipe will be used between Opelousas, La., and Chester Junction, and by using only 10 compressor stations of an aggregate 72,000 hp. instead of the 15 stations of 160,000 hp. originally proposed, the capactiy of the system will remain at the original estimate of 325,000 M.c.f. in summer and 340,000 M.c.f. in winter. Deadline for completion of the system, originally set for September 29, 1950, has been extended to April 1, 1951. The cost of construction is now estimated at $191,310,154.

The commission also authorized Trans-Continental Gas Pipe Line Corp. to take over, construct and operate the facilities proposed by the Trans-Continental company. The latter was a Texas corporation but the successor was incorporated in Delaware. The new company proposed to issue $143,000,000 of 20-year, 3⅝ per cent first-mortgage bonds, $26,500,000 in 5 per cent debt obligations to be converted into preferred stock in 1951, and 2,515,000 shares of 50-cent par common stock in the amount of $22,677,500.

Mississippi Company Seeks Third Main Line

FEDERAL POWER COMMISSION authority is being sought by Mississippi River Fuel Corp. to construct and operate additional natural-gas facilities, including a 650-mile pipe line extending from Louisiana into northern Illinois, increasing the company's daily delivery capacity by 500,000,000 cu. ft. to a total of about 766,000,000 cu. ft.

The company plans to build the facilities in two stages, with possible completion by 1954. The first phase of of the project includes construction of 205 miles of 26-in. pipe line extending north in Illinois from Belleville to Geneseo. This section will be connected to the company's existing facilities by a proposed 17-mile line between Belleville and the Columbia, Ill., measuring station.

The second step is a 434-mile 26-in. line which will follow a route from Farmerville, La., to connect with the 205-mile line at Belleville. The resulting line would have a capacity of 350,000,000 cu. ft. at its northern terminus when fully powered with a total compressor-station horsepower of 126,200.

The company is also seeking, as a part of the first phase, authorization to install additional compressor units totalling 65,000 hp. on the complete loop line previously authorized, between Perryville, La., and St. Louis. This would increase capacity of the existing loop line from 133,000,000 to 283,000,000 cu. ft. daily. Over-all cost of the entire project is estimated at $89,902,250.

Completion of the newly proposed facilities, along with installations already authorized by FPC, would give the company three main lines, two of which would serve the St. Louis area and the third, northern Illinois.

Cities Service Line Laid At 6,537 Ft. Daily Rate

Progress has been made at the rate of 6,537 ft. of 26-in. pipe per calendar day during the laying of the Ulysses-Hutchinson project of Cities

R. K. Shivel, superintendent, and C. S. Le Noir, general superintendent, H. C. Price Co., at 30-31-in. loop recently completed for Tennessee Gas Transmission Co. in Texas-Louisiana area

WE HAVE ALL THESE..

- FINANCES
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- ORGANIZATION
- EXPERIENCE

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- GASOLINE PIPELINES
- WATER PIPELINES

R. H. Fulton
& COMPANY
CONTRACTORS

PHONE 5231 BOX 1542
LUBBOCK, TEXAS

Service Gas Co., contracted by Ray L. Smith & Son, Inc. Early this week only 6 miles remained to be laid for this undertaking which includes 183 miles of main line and 10 miles of gathering line comprising a total of 193 miles of 26-in.

For laying the 22½-mile 26-in. Hutchinson - Newton extension for Cities Service, the Ray L. Smith organization has 12 miles to lay for completion scheduled in the middle of December.

In preparing for the 147½-mile, 26-in. Newton-Ottawa extension to be laid in 1949, Cities Service has received 16 miles of the pipe consignment which is scheduled to arrive at the rate of 13 miles per month until deliveries are completed in the middle of next year. All of this project will have 26-in. pipe with the exception of the Neosho River crossing which will be constructed with a double 20-in. line. Contracts have not been let for the Newton-Ottawa section.

New Edition of Pipe-Line Accounts Book Available

WASHINGTON. — Publication of a new edition of the "Uniform System of Accounts for Pipe Lines" has been announced by the division of transportation of the American Petroleum Institute.

Initial distribution of the book is being handled by Findlay Printing & Supply Co., 406 South Main Street, Findlay, Ohio. Copies are $1.50 each. After January 1, 1949, distribution will be handled by the A.P.I.'s New York office, 50 West 50th Street.

The new edition contains the complete accounting regulations prescribed by the Interstate Commerce Commission for carriers required to report to the ICC.

"Uniform System of Accounts for Pipe Lines" was reprinted first in 1943 under the auspices of the A.P.I. conference subcommittee on pipe line accounting regulations. Subsequent revisions and exhaustion of the original supply prompted the publication of the new edition.

Interstate Lays 5 Miles Of Aluminum Pipe

Interstate Oil Pipe Line Co. crews recently started construction of 5 miles of 6-in. aluminum pipe line in the sour-crude area near Magnolia, Ark. The line is being laid from Interstate's Magnolia pump station as part of the line into McKamie field, Arkansas.

This line is the second section of aluminum pipe to be laid in Interstate's system in the Magnolia area. The first experimental installation, made last April, has been watched with considerable interest by repre-

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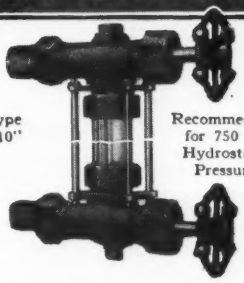
LIQUID LEVEL GAGES



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PIPE LINE SURVEYS

sentatives of the pipe line and allied industries.

All construction work is being performed by company personnel, with special attention being given to the development of practical field procedures for bending, welding and laying aluminum pipe.

Unlike the first section of aluminum pipe, which was laid bare, the new section will be coated and wrapped in the same manner as Interstate's steel lines in the same area. Removable sections are being flanged into the line to provide for future studies of the resistance of the relatively new pipe line material to both internal and external corrosion.

Tulsa Pipe Liners Club Elects 1949 Officers

The newly organized technical and operating organization, known as the Pipe Liners Club of Tulsa, representing 10 major pipe-line companies in the Tulsa area is now holding monthly dinner meetings. The following officers have been elected to serve for 1949: J. L. Cahill, chief engineer, Continental Pipe Line Co., president; P. L. Reichard, assistant general superintendent, Gulf Refining Co., pipe-line division, vice president; F. C. Whiteside, assistant chief engineer, Interstate Oil Pipe Line Co., treasurer; J. D. Jones, master mechanic, Gulf Refining Co., Tulsa, pipe-line division, secretary.

Members of the board of directors are: F. V. Cook, master mechanic, Stanolind Pipe Line Co.; G. D. Jennings, chief engineer, products pipe-line division, Phillips Petroleum Co.; J. F. Nickell, general superintendent, pipe lines, Wilcox Oil Co.; and S. C. Phelps, chief engineer, northern division, Interstate Oil Pipe Line Co. C. F. Luckfield, administrative assistant, Stanolind Pipe Line Co., had an active part in the organization of the Pipe Liners Club of Tulsa. This organization has no connection with the Pipe Liners Club, a social organization, which has a dinner during the week of the annual meeting of the American Petroleum Institute.

Spread to Move to South End of Phillips Project

More than 30 miles of pipe has been laid at the Borger, Tex., end of the 289-mile, 12-in. line of Phillips Pipe Line Co., according to reports early this week.

After finishing the laying of 36 miles of pipe delivered at the northern end of this Goldsmith-Borger project, the spread of the contractor, Morrison Construction Co., will be moved to the Odessa area where 50 miles of pipe has been delivered. Last summer seven miles was laid as the beginning of this project.

How to Protect PIPE JOINTS with TAPECOAT

It's easy to protect welded pipe joints when you use TAPECOAT . . . the modern protective coating in handy tape form.

You simply remove kraft paper on mill or machine coating, back far enough to start one spiral wrapping of TAPECOAT over mill coating. Then clean and dry the bare pipe with a torch. Next, start wrapping TAPECOAT on mill coating where kraft paper has been removed, flashing flame of torch lightly on TAPECOAT to bleed its coating, as illustrated, and permit it to conform readily to the contour of the pipe. Secure double thickness of TAPECOAT by overlapping slightly more than half the width of the tape. When wrapping is completed, flash the torch flame lightly over entire TAPECOATED section, to bleed coating to a shiny surface.

Write for complete details on this quick, clean, economical protection for pipe joints.

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FOR 8" TO 28" PIPE

18" UNIBOLT Closures replacing blind flanges on Moorlane Strainers.

EXTRA HINGES AVAILABLE FOR INSTALLATION ON UNIBOLT SCRAPER TRAPS ALREADY IN SERVICE

Pipeliners, who for years have struggled with heavy, multi-bolt blind flange closures on scraper traps, will welcome this easy-opening, sure-sealing UNIBOLT Scraper Trap. You just release two bolts and s-w-i-n-g the trap cover, or blanking plug, out of the way. A simple hinge carries the load. It's absolutely safe, eliminating heavy lifting, and there's nothing to fall on the workmen. Swing it shut, tighten two bolts, and the line is ready for business again!

Many operators who installed UNIBOLT Scraper Traps before the hinge design was available are now converting to the new design by installing the hinges on the job.

Any line or unit that requires a closure, such as Strainers, Separators, Scrubbers, Mist Removers and similar pressure vessels, may be UNIBOLT-equipped to real advantage. Wherever a blind flange is applicable, a UNIBOLT Coupling with Blanking Plug will seal tighter, reduce weight, and save time.

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Houston, Texas

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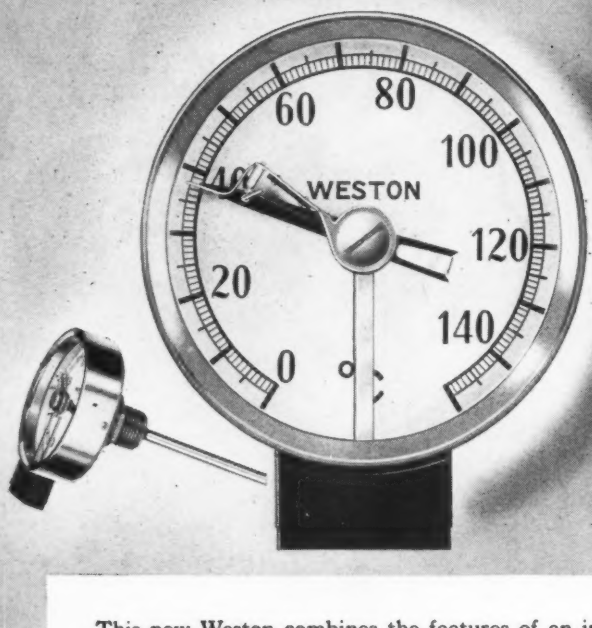
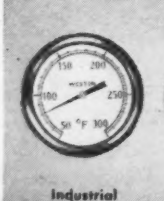


This new Weston combines the features of an indicating device with the advantages of an alarm or control instrument. A contact arm, mounted as shown above, is easily set to make contact at any temperature on the scale.

A terminal block on the periphery of the case makes electrical connection easy. The thermometer is all-metal, typically WESTON in ruggedness and reliability, with accuracy of ±1% as an indicating thermometer, and ±1½% as a contact making device. It is supplied in two types—for operation on either increasing or decreasing temperatures.

For complete information see your local WESTON representative or write Weston Electrical Instrument Corporation, 617 Frelinghuysen Avenue, Newark 5, New Jersey.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NATURAL GAS

December Natural-Gas Allowables Set for Texas

AUSTIN.—Daily allowable productiontion of sweet and sour natural gas for Texas fields during December has been set by the Railroad Commission as follows (figures in cubic feet):

District 2: (Southwest Texas) North McFaddin, 22,548,386.

District 3: (Gulf Coast) Alief, 10,-967,741; Blue Lake, 30,500,000; McCoy, 4,812,903; Needville, 33,896,773; North Louise, 4,751,613; Old Ocean, 231,305,-000; and Sublime, 7,000,000.

District 4: (Southwest Texas) La Blanca, 16,438,935; La Sal Vieja, 1,-612,904; McAllen, 14,516,127; Riverside, 9,953,870; Rooke, 15,509,677; and South Weslaco, 17,056,450.

District 6: (East Texas) Carthage, 654,011,561; Huxley, 1,935,484; Navarro Crossing, 11,935,483; Oakwood, 8,-094,838; Rodessa, 43,366,870; Tri-Cities, 18,064,516; Waskom, 101,070,-630; Whelan, 96,290,317; and Winnsboro, 5,857,258.

District 7: (West Central Texas) Sipe Springs High Pressure, 2,516,-129; and Eden, 5,387,096.

District 8: (West Texas) Weiner, 3,870,967.

District 10: (Panhandle) Panhandle, 1,884,301,100; and Texas Hugoton, 164,938.

Brooklyn Union Gas Co. Seeks Rate Increase

A petition for temporary increase in gas rates has been filed by Brooklyn Union Gas Co. with New York State Public Service Commission. If granted it would increase gross revenue of the company by approximately $2,200,000 annually.

Increased costs of labor and materials and the need for return on additional investment are cited by the company in support of its petition. The greatest single item is the increased cost of labor.

The proposed changes in rates are an increase of 8 cents in minimum charge to $1.18 for 600 cu. ft. of gas and an increase of 5 cents per 1,000 cu. ft. for all gas in excess of the minimum quantity.

For the average domestic customer the new rate would represent an increase of 5.5 per cent or about 14 cents a montn. The new rates would increase the costs to the average customer with gas house heating by about 6.5 per cent. If granted, the increase will go into effect on January 1, 1949.

Court Rules Gas Act Not Applicable to Gas Export

According to a ruling of the United States Circuit Court of Appeals the Federal Power Commission does not have power to regulate natural-gas companies which sell gas for export.

This decision was handed down by Judge E. Barrett Prettyman in setting aside an order by FPC which made Border Pipe Line Co. of Texas subject to regulations of the commission.

Since 1942 Border Pipe Line has requested and obtained permits from the commission for the export sale. In 1947, however, the commission issued an order which would have made the firm subject to regulations over rates, practices, financing, and other activities. The company appealed the order.

In setting aside the commission order, Judge Prettyman criticized FPC for attempting to expand its powers beyond "the plain language" of the Natural Gas Act.

Panhandle Natural Gas Is Bringing Higher Prices

According to the semiannual price report issued by the Texas Railroad Commission, producers in Texas Panhandle field, principal source for several gas-transmission companies, are receiving gradually increasing prices for natural gas.

The report shows Panhandle prices for sweet natural gas on a high pressure base average 4.33 cents per M.c.f., compared with 4.26 cents per M.c.f. last spring. Sweet gas on a lower pressure base averaged 3.87 cents per M.c.f., compared with 3.81 cents last spring.

Sour gas sells for 3.81 cents per M.c.f. average, under high pressure, compared with 3.76 cents per M.c.f. last spring and 3.42 cents on low pressure compared with 3.36 cents per M.c.f. last spring.

General Crude Is Not A "Natural-Gas Company"

A declaratory order has been issued by Federal Power Commission to the effect that the proposed sale of natural gas by General Crude Oil Co., Houston, to Texas Eastern Transmission Corp. is a transaction falling within that section of its general rules covering sales by producers and gatherers over which the commission does not exert jurisdiction.

General Crude Oil, according to its application, owns about 2 per cent of the gas reserves in Silsbee field, Tex., and has entered into contract along with three other gas producers in the area, to sell gas individually to Texas Eastern. The proposed deliveries, to be made from a plant operated by one of the other three producers for the four companies, are expected to commence prior to January 1. In its findings, FPC said General Crude Oil is not affiliated directly or indirectly with Texas Eastern by ownership of stock or otherwise.

Gasser Fire Under Control

HOUSTON.—After running wild for 6 days, the first wild gasser in the 15-year history of Carthage field, Panola County, Texas, was brought under control by a Stanolind Oil & Gas Co. crew. Well was the 7 Carthage Gas Unit on the northeast edge of the field.

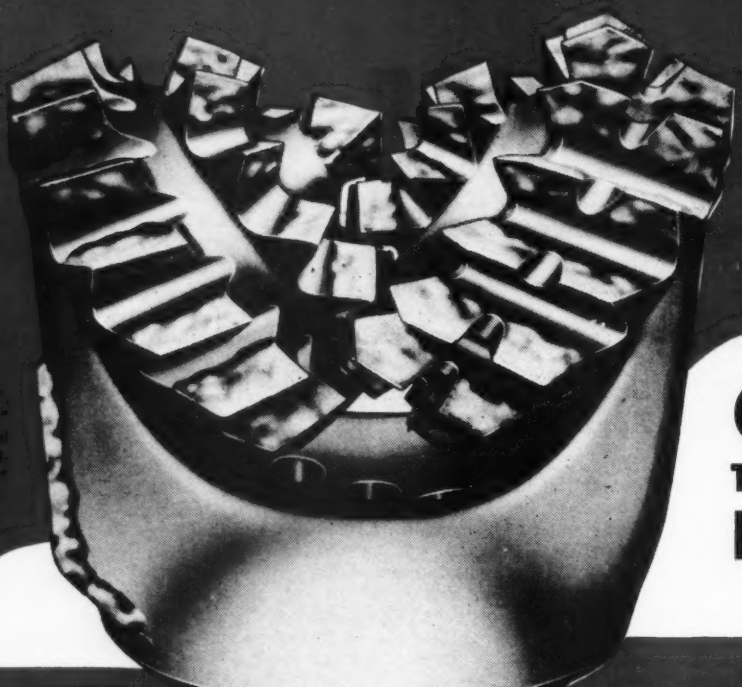
Natural Gasoline

Mineral Wells Plant Begun

The Brazos River Gas Co. of Mineral Wells, Tex., has begun construction of an absorption plant to process natural gas supplied by that company to the city of Mineral Wells. Facilities for recovery of 75 per cent propane are included in the plant, and production is expected to total 15,000 gal. daily. Robert L. Purvin and Richard Henry, consulting engineers of Dallas, have been retained to handle the processing and general engineering respectively, and to supervise construction and operation of the plant.

Gas Plants Authorized

Texas Railroad Commission has recently authorized several gas repressuring and cycling projects. They include: Bolin Trust to carry on a gas repressuring project in Wichita County; Superior Oil Co. to inject gas into the No. 2 Wilcox sand, in Altair field, Colorado County; and American Republic Corp. to install and operate a cycling plant in Silsbee field, Hardin County.



made in 3⅞", 4⅜", 4¾", 5⅛", and 6¼" sizes for geophysical work and in all standard sizes up to 12¼" for regular drilling.

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Drilling Contractors

Active Rotary Rigs Continue Record Levels

The increase in the number of active rotary drilling rigs in the United States and Western Canada continues to reach new high levels. Active rigs for the weeks ended November 15 and November 22 follow:

	Nov. 15	Nov. 22
Pacific Coast	219	207
Oklahoma	309	304
Kansas	130	127
Rocky Mountain (incl. W. Canada)	235	237
Ark., La., Tex.	188	188
West Tex. and N. Mex.	598	602
Gulf Coast	630	639
Illinois	145	153
Total	2,454	2,457

J. Lindas Organizes L-S-T Drilling Co., Inc.

L-S-T Drilling Co., Inc., has been formed in Wichita, Kans. The new firm, which operated temporarily as J. L. Drilling Co., was organized following the dissolution recently of Gabbert & Lindas Drilling Co., of Wichita and Great Bend, Kans., of which John Lindas and C. L. Gabbert were partners.

The new firm, of which Lindas is president, H. C. Turner, vice president, and Scott Stuckey, secretary-treasurer, has taken over two of the Gabbert & Lindas rotary rigs and four of the company trucks.

Gabbert will continue to operate one of the former Gabbert & Lindas rotaries and a cable-tool unit as Gabbert Drilling Co. He will use the original company's yard at Great Bend. L-S-T will use the yard of Lindas Oil Co., Inc., at Great Bend.

Creole to Use New Huge Marine-Type Rig

What is considered to be the world's largest marine-type diesel electric drilling rig has been built for Creole Petroleum Corp. for use in Lake Maracaibo, Venezuela.

The barge for the equipment is 70 ft. wide and 175 ft. long. The main power plant, supplying all electricity needed for drilling, consists of three 400-kw. d.c. generators. Four 75-kw. auxiliary generators supply power for lighting and other loads.

For the rig itself, the electric motors have a combined rating of 2,600 hp. They include three 500-hp. motors for mud pumps, one 800-hp. unit for hoisting, one 300-hp. unit for the rotary table, and a 60-hp. motor for mud mixing.

The floating powerhouse equipment was installed by Westinghouse Electric Corp. The barge was built at Avondale Marine Ways, near New Orleans.

Big West Sells Interest

Big West Drilling Co., of which Grady Vaughn and H. W. Klein, Dallas, are owners, is selling its interest in 21 wells in Lisbon and Claiborne parishes, North Louisiana, for approximately $4,000,000 cash. Purchaser is Texla Gas Corp., headed by Lewis T. Lohman, president. Lohman & Gardiner, Dallas and Beverly Hills, Calif., represented all parties in the transaction. Warren Wright's interest in the wells is not being sold. Texla will operate the properties.

New Mississippi Firm

A new drilling firm organized at Jackson, Miss., is Buffalo Drilling Co., with Dan L. Reynolds as president. Other officers of the new organization include: Wiley Wedemeyer, vice president, and Frank E. Davis, secretary-treasurer. Wedemeyer and Davis formerly were associated with Patrick-Terrell Drilling Co.

Young Drilling Co. of Calgary are contractors for the Calmont-Leduc 3 test located in LSD 4, 14-51-21w4, in the Cooking Lake area southeast of Edmonton.

Helmerich & Payne will drill Sells Petroleum Co. 1 Board of Supervisors, Section 16-3n-9e, in Pike County, Miss.

Calvert & Willis, Inc., drilling contractor and producer, has four rigs active on the following contracts: Ashland Oil & Refining Co.-Calvert & Willis 3 Lula Egli, 30-7s-10e, Gallatin County, Illinois; T. C. Teter 1

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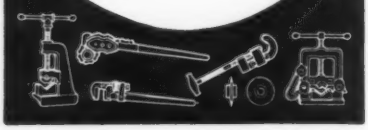

Dunbar, 4,000-ft. Trenton test in the old Centralia field; Stewart Oil Co. 1 U. S. Coal & Coke, 23-6s-4e, Franklin County, Illinois; and Cities Service Oil Co. 4 Mount in Omaha field of Gallatin County.

Golding & Farris have contract to drill W. L. Goldston 1 J. R. & A. D. Willbern, a wildcat test in Ramon Musquiz Grant, 1½ miles northwest of Charco, in Goliad County, Texas. Contract depth 8,200 ft.

Can-Tex Drilling Co. is moving rig in and drilling is scheduled to begin immediately on the Anglo Canadian Oil Co. and Home Oil Co. Anglo-Home-Redwater 1 in LSD 16, 36-57-22w4, Alberta, Canada.

Herndon Drilling Co. was making hole at 1 Bemis "A," NE NE NE 15-12s-19w, 5 miles southwest of the Riverview pool in Ellis County, Kansas.

Lewis Greer, Baton Rouge, La., has been awarded contract to drill Lynn Oil Co. & Temple Hargrove et al 1 State of Louisiana, Lease 418, a wildcat venture in Lake Pontchartrain of St. Tammany Parish, Louisiana. Scheduled depth is 7,600 ft.

Sam K. Pack and **Braden & Green Drilling Co.** have announced location for 1 Griebel, NE NE NW 8-7s-19w, 4 miles northeast of the Alcona pool and 4 miles north of Webster, Kans.

I. G. Watkins Drilling Co. has changed back to rotary tools at a depth of 3,806 ft. on the Pure Oil Co. et al 1 M. L. Walker, NE¼ 22-N-24, 1¼ miles southeast of Sebrees in Webster County, Kentucky. The company originally started drilling operations by rotary and later changed to cable tools. Contract depth is to 7,000 ft.

Brunson Drilling Co. has staked location for 1 Braun, NW NW SE 35-12s-17w, 2 miles northeast of the Catherine pool in Ellis County, Kansis. Brunson will move in tools upon completion of 1 Schmeidler, NW NW NW 27-12s-17w, ½ mile north of the Schmeidler pool which was drilling below 3,520 ft.

Delaney Drilling Co. will drill 1 Guild in the northeast corner of 23-13n-5e, in southeastern Lincoln County, Oklahoma. The test will be to 3,300 ft.

Lasiter Drilling Co., Del Rio, Tex., has filed an application with the Texas Railroad Commission requesting a permit to start operations immediately on its 1 Iowa Realty Trust as a 2,000-ft. wildcat in north Pecos County, 11 miles southwest of Imperial. The drill site will be 330 ft.

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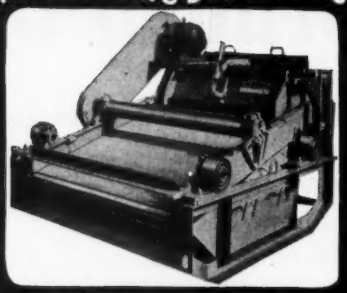

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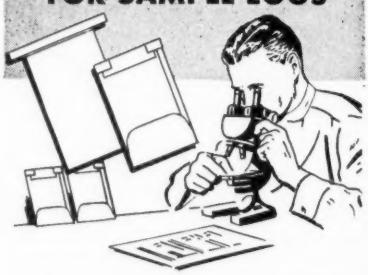

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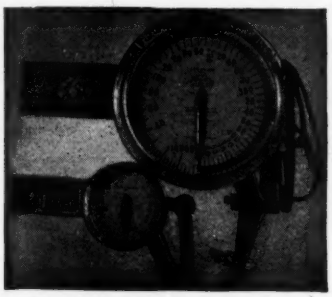

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from northeast and 1,650 ft. from northwest lines of southwest half of the north quarter of Section 27, Block 10, H&GN Survey. Cable tools will be used.

Ashby Drilling Co. 7 Barringer, SW SE NE 29-1s-16w, was bottomed out at 1,018 ft., 5 ft. in the Traverse lime in the Geneva Traverse field in Van Buren County, Michigan. The well was rated at 15 bbl. daily.

Wolf Creek Drilling Co., General Exploration, Inc., et al 1 Bynum in the SW SW SE 18-32-6e, 1 mile north of the Turner pool in Cowley County, Kansas, has topped the Layton formation at 2,253 ft. and a 6-ft. saturated section was found at 2,286-92 ft.

Falcon Seaboard Drilling Co. and Fred T. Haddock in the northern sector of Okfuskee County, Oklahoma, are drilling 1 Gill estate in NE SE SW, 24-13n-10e, on a 480-acre block. The well is 3 miles northeast of the South Haydenville pool.

Summit Drilling Co. has surface pipe set on new Noble County, Oklahoma, wildcat in southeastern portion of the county, 1 Swarts, NW NW SW, 8-20n-1e. The operation is approximately 3 miles northwest of Callery and Hurt 1 Wiegel, wildcat in the SW NW NE, 28-20n-1e, which is drilling in the Mississippian.

Brunson Drilling Co. tools are making hole on the George F. Johnston, Jr., 1 Westaver, NE NE NE 17-21s-12w, 1¼ miles north of the Syms pool near the northern edge of Stafford County, Kansas.

H. E. R. Drilling Co. has staked 1 Hirzel in C N½ N½ SW of 7-16n-2w. Location is the northwest offset to the most westerly well of the Guthrie Townsite pool and is ¼ mile west of Guthrie, Okla. Prior to this test the most recent drilling was a year ago.

M. & M. Drilling Co. will drill William Helis 4 Armelise Planting Co., 43-12s-13e, Napoleonville field, Assumption Parish, Louisiana, to a contract depth of 7,000 ft. M. & M. also has contract to drill William Helis 1 Chas. G. Hooks et al, wildcat, Section 23-9s-5w, in Jefferson Davis Parish, Louisiana, to a depth of 11,000 ft.

Commonwealth Drilling Co. will drill the Anglo-Home-Redwater 2 in LSD 15, ¼ mile west of No. 1 in Alberta, Canada. Work on the site has started and drilling is to get under day soon. Commonwealth is moving in rig on the Princess Petroleums, Ltd., and Max Bell group P.S.&P.-Redwater 1 in LSD 13, 36-57-22w4, ½ mile west of Anglo-Home 2.

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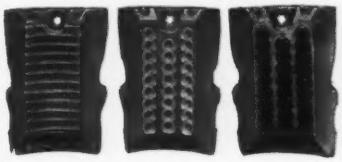

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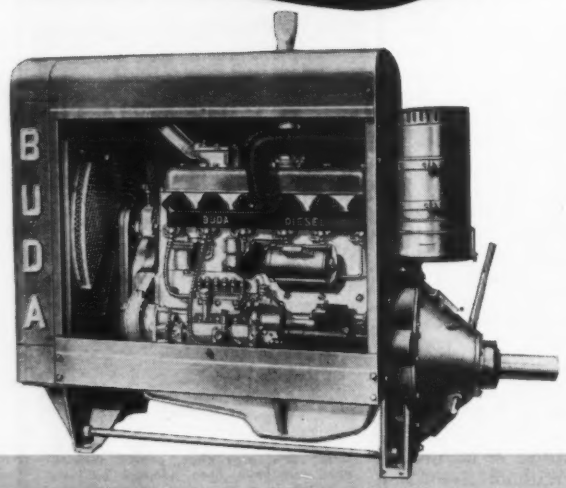

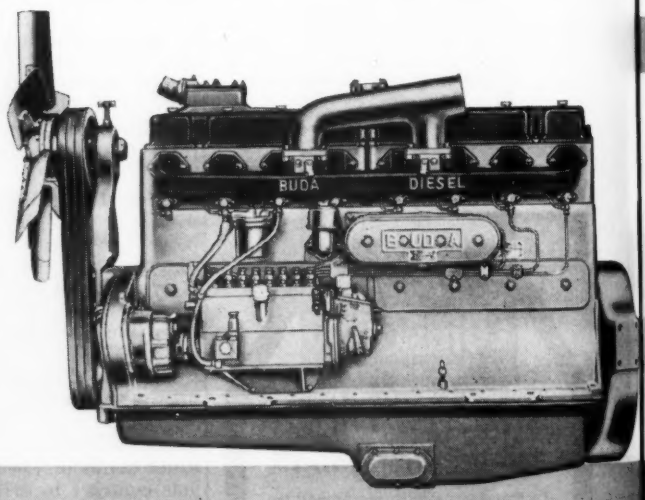

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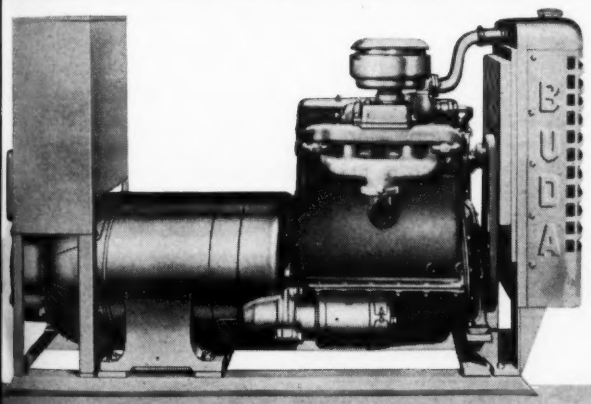

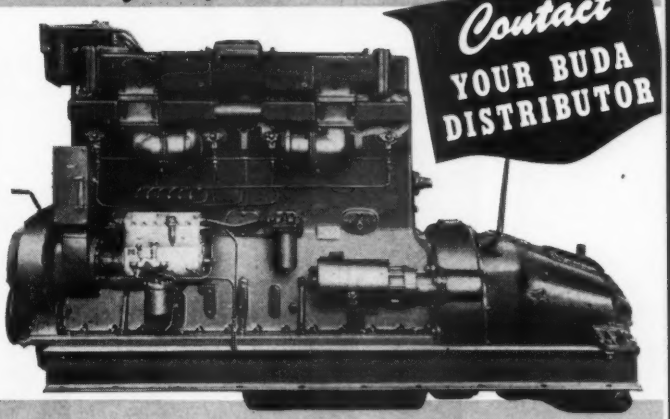

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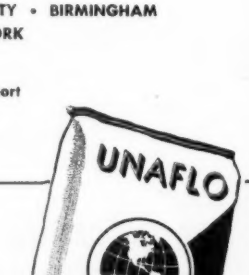

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Exploration and Drilling

What Is the "American Geological Institute"?

LAST week oil men read that a new scientific organization, the American Geological Institute, had been formed in Washington, representing 11 professional societies. *(See The Oil and Gas Journal, November 25, 1948, page 69).*

Since then many people have asked what this is all about. One question can be answered quickly. The new institute is definitely not a government agency, nor is it government sponsored or financed. The nominal sponsor is the National Research Council, but N.R.C. is not a Government-financed agency. This council was organized in 1916 by the National Academy of Sciences, at the request of President Woodrow Wilson, and has functioned ever since completely independent of government control.

The new Geological Institute is the outcome of 6 years of discussion and work by a large number of geologists, and successive officers of the 11 federated societies during those years. The idea started with a talk by Carey Croneis on "Geology in War and Peace" in April 1942 at the Denver meeting of the American Association of Petroleum Geologists.

Croneis followed up with talks on "Geological Warfare" before several local geological society meetings. This stirred up so much interest that Fritz L. Aurin, then president of A.A.P.G., invited all national and local scientific societies that had geology as a major interest, to send a representative to Fort Worth for a meeting on April 10, 1943.

From that point on, considerable hard work has gone on in committees and with various proposals thrashed out among officers of 11 different professional societies. Six and a half years from the original suggestion of Croneis, all 11 of the national societies originally considered eligible have joined the new institute.

The new institute makes the third such federated organization in which all societies of one science are joined. The Union of Biological Societies was founded nearly 29 years ago, and the American Institute of Physics is now in its eighteenth year.

What will the new Geological Institute do? The original program listed nine possible objectives. Frankly, it seems likely that the first objectives will have to be tied into the preparedness program in the cold war against communism. Cold war calls for preliminary organizing in case shooting war should come. Modern war is total war. Total war means total organization and mobilization of scientific resources as well as manpower and material. That is what the authorities on total war tell us.

One of the original tentative objectives was phrased this way: "To serve as a single, unifying, and authoritative voice for all branches of geologic sciences in relation with Government, in military circles, and to the general public." That sentence was written in 1944, but it sounds quite timely in 1948.

Congressional committees usually listen to scientific society representatives with more respect than they do to industry representatives. They discount the selfish interest of the industry witness; but not so much discount is given to a scientific society witness.

Now questions of national policy on mineral resources can be checked by taking testimony also from the American Geological Institute. Both the petroleum industry and government should profit by the existence of this new organization.

HIGHLIGHTS OF WEEK'S DEVELOPMENTS

ROCKY MOUNTAIN AREA.—The first commercial discovery of oil in the Mesa Verde (upper Cretaceous) formation is apparent at Pure Oil Co.'s second West Poison Spider wildcat, which flowed at the rate of 1,600 bbl. of oil per day on drill-stem test between 9,230-88 ft. Operator is now running casing. Saturated Tensleep has been found at Stanolind Oil & Gas Co.'s Big Sand Coulee wildcat, Park County, Wyoming.

SOUTH LOUISIANA.—Humble Oil & Refining Co. A-1 Caminada Pass, opened a new oil field off Grand Isle in the Gulf of Mexico, flowing a potential of 182 bbl. of 37.8°-gravity oil per day through a 5/32-in. choke. Magnolia Petroleum Co. 1 State Lease 838, Block 45, in the Eugene Island area, 12 miles from the nearest point of shore line, flowed 59.69 bbl. of 45.4°-gravity condensate per day, through perforations at 11,351-58 ft.

TEXAS PANHANDLE.—Sinclair Prairie Oil Co. apparently had a yet-unconfirmed gas-distillate discovery in northwestern Roberts County at the 1 Charles Lips, 30 miles west of Canadian, 4 miles north of the Canadian River and 1 mile south of the Ochiltree County line. Started as an Ellenburger test, it was said to be flowing between 5,000,000 and 7,000,000 cu. ft. of gas, plus 36 bbl. of distillate a day, from the Pennsylvanian around 5,500 ft. Of particular importance, if it produces commercially, is the fact it will be the Panhandle's first production below the regular pay zones. Local observers contend it is well within the Texas portion of the Anadarko Basin, an area that has long held promises of future deep reserves.

WEST TEXAS.—Seaboard 2 Tora Campbell, first Ellenburger test in the Vealmoor Canyon lime field of Howard County, placed a tentative top on that zone at 10,025 ft., on elevation of 2,628 ft. It was to drill-stem test at 10,100 ft. Magnolia's 1-A TXL, Upton County wildcat, was drilling in Simpson lime below 12,482 ft.

NORTH TEXAS.—Northeastern Jack County conglomerate gas-distillate discovery is completed within 5 miles of similar production on the flanks of the prolific Chico field of Wise County.

TEXAS GULF COAST

Goliad County Has New Gas-Condensate Discovery

HOUSTON.—H. R. Smith and W. C. McBride, Inc., 1 Carl Weise, a new gas-condensate discovery in northern Goliad County, a mile west of the Weesatche field and 1½ miles northeast of the "Melrose" field discovery, flowed 60 bbl. of condensate per day through a 10/64-in. choke, working pressure of 2,485 psi. Operators now are waiting on open-flow potential gage. Production is through perforations at 7,843-58 ft., in the Slick sand of the upper Wilcox or Carrizo zone. This discovery is located 3 miles southwest of town of Weesatche and approximately 2½ miles southwest of Gottschalt field, in R. E. Handy Survey A-158.

A new oil pool approximately 1½ miles off the south flank of the South Liberty dome in Liberty County, has been opened by Gulf Oil Corp. 1 Sidney A. Smith et al, located in the William D. Smith Survey, Abstract 106. Gulf has requested that the area be designated as "South Dayton." Drilled to 9,936 ft., the pay was topped at 8,562 ft. On initial test through perforations at 8,562-8,600 ft., using 9/64-in. choke, the well flowed 254.20 bbl. of 38.9°-gravity oil per day with flowing pressure on tubing at 1,325 psi. Gas-oil ratio 695.

A new gas-condensate discovery well in Goliad County, approximately 9 miles west of Goliad townsite, Amerada Petroleum Corp. 1 R. F. Irby flowed an estimated 2½ bbl. of condensate per hour through a 5/32-in. choke, 47.8°-gravity condensate with a large gas flow and very little salt water, under 4,000 psi. working pressure, through perforations at 9,256-64 ft. Total depth is 9,756 ft., with 5½-in. casing set to 9,231 ft. This well is in M. J. Ybarbo Grant.

J. S. Abercrombie and Magnolia Petroleum Co. 1 Anna B. Whiteside has been completed as an excellent oil producer in the Larsen Reservoir, F-21 sand, at Old Ocean field, Brazoria County. The well is about ¾ mile southeast of the 1 Allhands, nearest production, and is in James Cummings Survey, Lot 40. Drilled to a total depth of 11,553 ft., with 7-in. casing cemented at 11,461 ft., on 24-hour potential gage, the well flowed at the rate of 412.35 bbl. of 34.4°-gravity oil per day through a 12/64-in. choke. Flowing pressure on tubing 1,319 psi., gas-oil ratio 881. Production is through perforations at 11,313-21 ft., with top of sand at 11,294 ft.

There were 39 new locations reported for Districts 2 & 3, with 12 being wildcat starts, 2 each in Harris and Jackson, and 1 each in Brazoria, Calhoun, Fayette, Goliad, Jasper, Jefferson, Liberty, and Wharton counties. Two successful exploratory tests opened two gas pools, 1 each in Bee and Victoria counties. Nine wildcats were failures, 3 in Karnes and 1 each in Fort Bend, Goliad, Matagorda, Orange, San Jacinto, and Waller counties.

TEXAS GULF COAST (DISTRICTS 2 & 3) SUCCESSFUL WILDCATS

Bee County: New gas discovery—Rudco Oil & Gas and Rock Hill Oil Co. 2 C. P. Sparkman, in Asa Walker Sur., 1 mi. NE of Mineral, TD 7,608 ft., top pay 7,554 ft. (Massive Wilcox), perf. 7,554-62 ft., IP: 20,000,000 cu. ft. gas per day on open flow, GOR 20,000, gravity 54°.

Victoria County: New gas pool—Fidelity Oil & Royalty Co. 1 W. H. Reeves, 2 mi. S-SW of Raisin, in J. M. Cobarrubias Grant, TD 5,627 ft., top pay 4,010 ft. (Frio sand), perf. 4,(0-20 ft., IP: 64,000,000 cu. ft. gas per day on open flow, shut-in pressure 1,698 psi., no water.

TEXAS GULF COAST (DISTRICTS 2 & 3) WILDCAT FAILURES

Fort Bend County: W. L. Goldston 1 H. Eisman, in Wm. Garnett Sur., A-174, 3½ mi. W of Needville, dry, TD 6,225 ft.

Goliad County: Transwestern Royalty Co. 1 W. A. Stockton, in Victor Blanco Grant, 1½ mi. SW of Charco townsite, dry, TD 4,926 ft.

Karnes County: H. M. Amsler et al 1 Mary Pargmann et al, in Victor Blanco Grant, A-3, 6 mi. S-SE of Runge, dry, TD 7,600 ft.

J. W. Gorman 1 F. J. Guenther, 3 mi. NW of Gillette, in T. K. Wheeler Sur. 73, dry, TD 6,020 ft.

Luling O. & G. Co. 1 Joe Moravits, in Fernando Carrilla Grant, 8 mi. E-NE of Falls City, dry, TD 6,210 ft.

Matagorda County: Tidelands Oil Corp. and Superior Oil Co. 1-483 State of Texas, in Gulf of Mexico, 15 mi. E of Port O'Connor, Tex., and 3 mi. off Matagorda Peninsula, dry, TD 8,277 ft.

Orange County: Atlantic Refining Co. B-1 Miller-Vidor Lbr. Co., in Wm. Stephenson Sur., A-23, 4 mi. S of Vidor, dry, TD 9,321 ft.

San Jacinto County: Butcher-Arthur, Inc., A-2 Coline Oil Corp., in Jas. Rankin Sur., approx. 1½ mi. SW of Cold Spring field production, dry, TD 4,580 ft.

Waller County: J. S. Abercrombie 1 Thos. H. Hubbard, in H&TC Sec. 53, 9 mi. N of Brookshire townsite, dry, TD 7,518 ft.

MICHIGAN

Testing Continues for Mason County Wildcat

MT. PLEASANT.—On the western rim of the Michigan basin, Louis Rose 1 Goodrich, SW SW NW 27-20n-17w, Mason County wildcat, was being closely watched as perforation and tests of the Monroe and Dundee zones were in progress. The Monroe-"Reed City zone" was perforated with a total of 45 shots between 1,945-53 ft., and 1,965-78 ft. No shows of either oil or gas were recovered following perforation.

A small oil showing was reported in a Dundee zone core, between 1,877-83 ft., but on drill-stem test, only salt water was recovered. This horizon was being gun-perforated for further test.

General activity in the state was slow with only 15 completions, of which one was a small Traverse discovery oil well in Kent County. Nine of the newly completed tests were dry holes.

Another Kent County wildcat oil test, which has been under test in the Traverse lime, was scheduled to be deepened to the Dundee section after acid treatment in the Traverse increased salt water but failed to increase oil production.

The shallow 1,000-ft. Geneva Traverse coral reef field, Van Buren County, was currently the most active area in Michigan. Four new oil-well completions were scored there, one of which was reported to be flowing at the rate of 5 bbl. of oil an hour following acid treatment.

In the center of the Michigan basin, a mile west of the Bentley Dundee field, Gladwin County, Eugene Hilliard 1 State-Bentley A-10, NW NW NE 19-17n-2e, was under test in the Dundee after acid. Well was being flowed through a highly restricted choke at the rate of 35 bbl. an hour.

Permits for 17 new drilling starts were approved during the week ended November 19, of this number, seven were classified as wildcat tests.

MICHIGAN SUCCESSFUL WILDCAT

Kent County, Courtland Township: S. L. McCall 1 R. Townsend, NW SW SW 19-9n-10w, 5 bbl. with water, Traverse lime 2,256 ft., TD 2,261 ft.

MICHIGAN WILDCAT FAILURES

Allegan County, Valley Township: The Ohio Oil Co. 1 Howard Taylor Stuch, NW NW NE, 23-2n-14w, Traverse lime 1,370 ft., TD 1,373 ft.

Arenac County, Deep River Township: Mason E. Holloway 1 Krysinski, NW SE SE 23-19n-4e, dry, Dundee 2,730 ft., TD 2,912 ft.

Adams Township: Ervin Major 1 Burton C. Smith Adm., SW SW SE 34-19n-3e, dry, Dundee 2,860 ft., TD 3,063 ft.

Montcalm County, Bloomer Township: Mercer Oil Co., Inc., 1 Anna B. Snyder, NE SW SW 13-9n-5w, dry, Dundee 3,050 ft., TD 3,145 ft.

Oceana County, Golden Township: Roosevelt Oil & Refining Co. 1 National Resort, Inc., SW SE NW 4-15n-18w, dry in Red Rock, TD 820 ft.

EASTERN TEXAS

Carthage Field Gets Good Gas-Distillate Well

DALLAS.—A new gas-distillate well flowing an estimated 100,000,000 cu. ft. daily was added to Carthage field of Panola County last week, extending production about 2 miles to the southeast. The well is M. B. Chastain, of Shreveport, and associates' 1 Briggs, in the Needham Survey, and on a block of 6,000 acres taken over from Continental Oil Co. Additional wells were to be drilled if the first had commercial production.

The 1 Briggs was perforated in the upper and lower levels of the Lower Pettit zone, at 5,977-5,990 and 6,027-44 ft. After acid treatment with 5,000 gal., the well was opened and gas come to the surface in 10 minutes. It cleaned itself into pits for 1½ hours, at which time it was estimated to be making from 75-100 bbl. of straw-colored distillate a day, with no water. Flowing pressures were 2,525 psi. on tubing and 2,650 psi. on casing.

Bert Fields 1 J. D. Woolworth, W. B. Ashlin Survey, Panola County, prospective link between the Waskom and Bethany areas, squeezed perforations in the Hill zone at 4,964-66 ft., and the Travis Peak at 6,220-22 ft., drilled cement plug and perforated again at 6,220-22 ft., and 4,910-40 ft. Tests had not been made at last report.

In Hopkins County, north of the Mitchell Creek discovery, Shell Oil Co., Inc., 3 Hedrick, Halyard Survey, reported an initial potential gage of 110 bbl. of oil, plus 2 bbl. of salt water, in 13 hours of pumping, from the Paluxy at 4,490-4,500 and 4,516-42 ft.

Unconfirmed reports indicated Humble Oil & Refining Co.'s deep Freestone County wildcat, the 1 McWatters, was still active and making additional sidewall cores around 16,000 ft., plugged-back total depth. It had been drilled out to 16,340 ft.

In Harrison County, 12 miles southeast of Marshall, a 6,566-ft. dry hole originally drilled by E. C. Johnston as 1 Edna Hood, Wallace Survey, was reported showing for a gas-distillate discovery, flowing at the rate of 1,000,000 cu. ft. daily through ¼-in. choke, with some 15 bbl. of distillate. Further details were not available. Original tests were said to have included both the Travis Peak and Pettit zones.

EAST TEXAS (DISTRICTS 5 & 6) WILDCAT FAILURES

Anderson County: Humble Oil & Refining Co. 1 T. O. Milner, J. F. Martin Sur., 1½ mi. NE Fosterville, dry, TD 10,896 ft., Pecan 3,437 ft., Austin 4,537-4,907 ft., Woodbine 5,126 ft., Goodland 7,264 ft., Trinity 7,486 ft., Massive 9,490-9,775 ft., James 10,220 ft., Pettit 10,570 ft., by samples.

Limestone County: Blake Smith 1 Lucretia Hancock, Rozelia Scott Sur., 3 mi. W Tehuacana, dry, TD 2,740 ft., Austin 1,880-2,190 ft., Woodbine 2,590 ft., elevation 512 ft.

Smith County: Humble 1 Katie E. Sackett estate, Tejeda Sur., 3 mi. NW Bullard, dry, TD 10,600 ft., bailed some oil, noncommercial, sample tops: Austin 4,753-4,952 ft., Woodbine 5,177 ft., base Massive 9,570 ft., James 10,065 ft., Pettit 10,255 ft., Travis Peak 10,550 ft., elevation 552 ft.

SOUTHWEST TEXAS

New Gas Pool in Starr County Opened

CORPUS CHRISTI.—A new gas pool for Starr County has been opened at Continental Oil Co. 5 Dee Development et al, in the Rincon area, in Gregorio Jiminez Survey 280, 1½ miles east of Rincon field. Drilled to a total depth of 6,005 ft., this well flowed an initial production of 14,000,000 cu. ft. of gas per day on open flow, through perforations at 4,245-66 ft. Total depth is 6,005 ft.

Humble Oil & Refining Co. B-5 John G. Kenedy, Jr., relief well to B-4 Kenedy, in El Paistle Grant, 3½ miles northeast of Sarita, was completed in a new pay, perforations at 2,278-88 ft., flowing an initial production of 8,200,000 cu. ft. of gas per day on open flow. Shut-in pressure 1,020 psi. Total depth is 2,420 ft.

Potential gage has been reported for the discovery well of the Semmes pool, Starr County. Coastal Refineries, Inc., and W. D. Kennard 1 D. R. Semmes, Porcion 88, 15 miles east-northeast of Rio Grande City, in Share 20-B, Valadez heirs fee, flowed 14 bbl. of oil per day through 3/32-in. choke, with gas-oil ratio of 8,100 and tubing pressure 700 psi., casing pressure 1,020 psi. Total depth is 3,033 ft.

Dane, Bond & Jones 1 Adolph Koepp, shallow wildcat test in Guadalupe County, approximately 6,700 ft. southwest of the discovery well at the new "Seguin" field, 5 miles north of Seguin, had a good show of oil at 890-94 ft., and other shows at other levels. Operators now are running production test. This test is in the northeast corner of a tract of 139.27 acres, subdivision 215, Antonio Maria Esnaurizar XI League Grant.

There were 39 new locations reported this week with 18 being wildcat starts, 3 each in Webb and Zapata, 2 each in Duval, Jim Hogg, and Starr, and 1 each in Atascosa, Brooks, Edwards, Kenedy, Nueces, and San Patricio counties. Three successful exploratory tests were completed, 2 in Starr and 1 in Kenedy County while 6 wildcats were dry, 2 in San Patricio and 1 each in Caldwell, McMullen, Webb, and Zapata counties.

SOUTHWEST TEXAS (DISTRICTS 1 & 4)
SUCCESSFUL WILDCATS

Kenedy County: New gas pay, Sarita—Humble Oil & Refg. Co. B-5 John G. Kenedy, Jr., in El Paistle Grant, 3½ mi. NE Sarita, (relief well), TD 2,420 ft., top pay 2,278 ft., perf. 2,278-88 ft., IP: 8,200,000 cu. ft. gas per day on open flow, shut-in pressure 1,020 psi.

Starr County: New gas discovery—Continental Oil Co. 5 Dee Davenport et al (Rincon area) in Gregorio Jiminez Sur. 280, 1½ mi. E of Rincon field, TD 6,005 ft., top pay 4,245 ft., perf. 4,245-66 ft., IP: 14,000,000 cu. ft. gas per day on open flow.

New oil discovery "Semmes"—Coastal Refineries, Inc., and W. D. Kennard, 1 D. R. Semmes, Porcion 88, 15 mi. E-NE of Rio Grande City, in Share 20-B, Valadez hrs. fee, 2½ mi. SE of South Ricaby field, TD 3,033 ft., perf. 2,466-67 ft., IP: 14 bbl. oil per day through 3/32-in. choke, GOR 8,100, TP 700 psi., CP 1,020 psi.

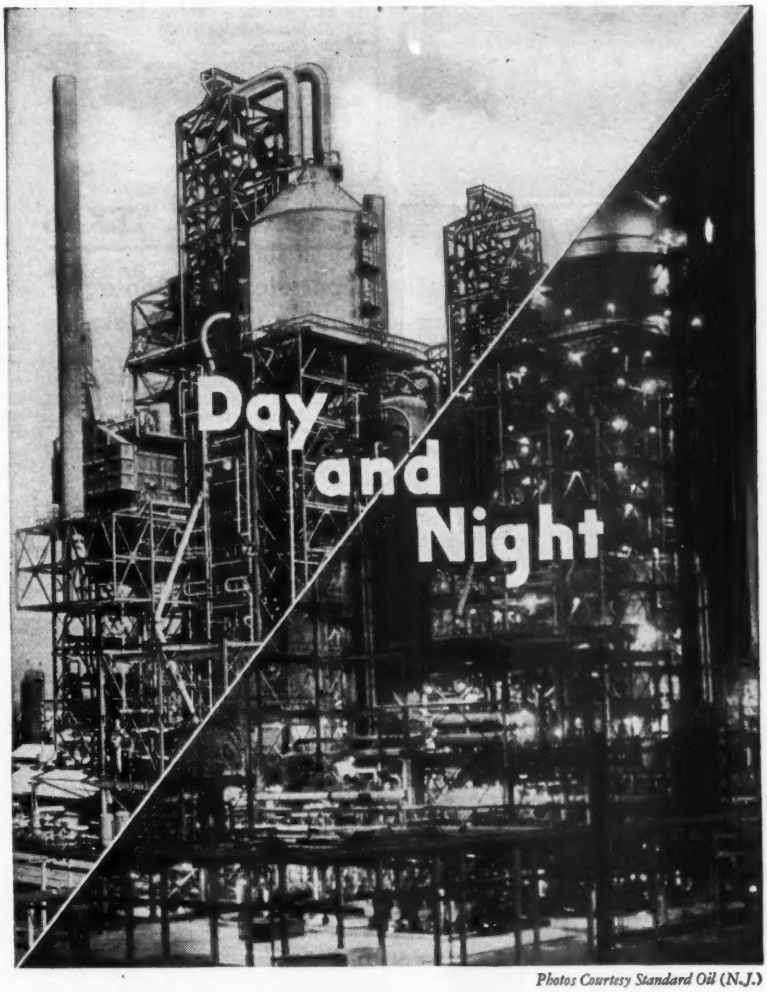
SOUTHWEST TEXAS (DISTRICTS 1 & 4)
WILDCAT FAILURES

Caldwell County: Weigand Bros. 2 Pat King, in Sampson Connell Sur., 2 mi. S of Lytton Springs, dry, TD 1,970 ft.

McMullen County: J. E. Mowinckle et al 1 T. R. Kuykendall, in J. M. Houston Sur. 9, 8½ mi. NW of Tilden, dry, TD 6,555 ft.

San Patricio County: Lamar Hunt Trust Est. 1 L. R. Sadler, in 4th addn. of Taft Farm lands, 2½ mi. E-NE of East Taft field, 7½ mi. NE of Taft, dry, TD 9,200 ft.

Southern Minerals Corp. 1 Wildschultz



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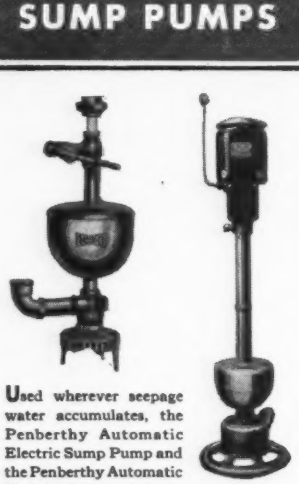

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est., in Geo. Morris Sur., 4 mi. W of Sinton, dry, TD 6,574 ft.

Webb County: Geo. Buck 1 A. Garcia, in W. R. Barresley Sur. 2084, 9 mi. SW of Mirando City, dry, TD 1,569 ft.

Zapata County: John F. Camp & Sons 1 Gutierrez & Flores, in Charco Redondo Grant, 34 mi. SE of Zapata, dry, TD 2,776 ft.

N. CENTRAL TEXAS

Operations in Montague County Continues Active

WICHITA FALLS.—Montague County operations continued to highlight field reports for the second week. Continental Oil Co. Bend conglomerate discovery northwest of Ringgold completed for an initial potential of 118 bbl. of 40°-gravity oil, plus 10 bbl. of water, from perforations at 5,970-80 ft. Gas-oil ratio was 300 cu. ft. The new well, 1 Staley, had flowed 94 bbl. of oil, plus considerable sediment and water in 24 hours. The completion test was through 16/64-in. choke. Earlier reports indicated the well would be plugged back if the water could not be exhausted.

Star Oil Co. completed a confirmation well to a discovery of some 5 years ago, in southwestern Montague, 6½ miles southwest of Bowie. The new well is Star 1 Eanes, G. A. Bench Survey, and 1,500 ft. northeast of the original discovery. It topped the Caddo at 5,637 ft., drilled to 5,654 ft., which was thought to be in the conglomerate but top on that zone was not forthcoming. A 1-hour drill-stem test to total depth recovered 840 ft. of free oil and 35 ft. of oil-cut mud. Operators continued drilling below 5,715 ft. Location is on a farmout from Sinclair-Prairie Oil Co., which drilled the discovery of Eanes field.

Seven miles southeast of Bowie, Continental Oil Co. 1 Richardson, Block 79, Titus County School Land Survey, was drilling below 5,316 ft. in shale and sand. Four miles northwest of Bowie, R. B. Thrift 1 W. R. Potter, Block 2,813, TE&L Survey, was drilling below 6,209 ft., in shale and sandy lime.

Jack Grace 1 T. H. Cherryhomes, C. J. C. O'Connor Survey, 4 miles southeast of Cundiff, in northeastern Jack County, completed as a Bend conglomerate gas-distillate discovery. It had a high yield of 67°-gravity distillate, making 77.8 bbl. on somewhat less than 1,000,000 cu. ft. of gas a day. Production was through perforations from 5,472-90 ft., using ¾-in. choke. Location is 5½ miles southwest of Chico Bend conglomerate field of Wise County. The well was originally started by Star Oil Co. and later taken over by Grace.

In southwestern Throckmorton County, M. A. Grisham 1 Gregory, Section 1,193, TE&L Survey, south outpost to Morrison (Strawn) field, indicated a Mississippian strike. The lime was topped at 4,668 ft., and drilled to 4,716 ft. where a 2-hour drill-stem test brought gas to the top in 28 minutes and recovered 960 ft. of clean oil, 110 ft. of oil-cut mud and 1,150 ft. of drilling mud. Bottom-hole pressure was 2,050 psi. Casing was to be run for further testing. Grisham announced location for the 2 Gregory, to be a south offset to the discovery, and which will be a Strawn test.

Three miles northwest of the 1 Gregory, Grisham 6 Brown, south offset to Mississippian lime discovery in Block 1,613, TE&L Survey, was drilling below 4,100 ft., still in the Strawn. A drill-stem test from 4,013-30 ft. recovered 30 ft. of oil-cut drilling mud in a nonporous sand.

D. D. Feldman 1 Turbeville, Block 22, Jefferson County School Land, 8 miles southeast of Archer City, recovered 15 ft. of clean oil and 45 ft. of oil-cut mud, on a 40-minute drill-stem test of Strawn sand at 3,265-75 ft. Bottom-hole pressure was 1,375 psi. in 20 minutes. Drilling continued below 3,380 ft., to test deeper horizons before completion attempt.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) SUCCESSFUL WILDCATS

Archer County: George W. Graham 1 L. F. Wilson "H," Sec. 20, H&TC Sur., 12 mi. NE Archer City, pumped 35 bbl. 42°-gravity oil, 8 bbl. water a day, perforated 5,192-5,212 ft., TD 5,675 ft.

Jack County: Star Oil Co. 1 T. H. Cherryhomes, C. J. C. O'Connor Sur., 4 mi. SE Cundiff, flowed 77.8 bbl. 67°-gravity oil in 6 hours, ¾-in. choke, casing pressure 600 psi., tubing 200 psi., GOR 1,000 cu. ft., potential 312 bbl. a day, perforated conglomerate 5,472-90 ft., TD 6,720 ft.

Montague County: Continental Oil Co. 1 L. M. Staley, R. Crawford Sur., A-148, 3 mi. NW Ringgold, perforated conglomerate 5,970-80 ft., ran 2-in. tubing, flowed 457 bbl. 39.7°-gravity oil in 8 hours, 1-in. choke, pulled tubing and reran, potential flowed 118 bbl. oil a day, plus 10 bbl. water, ¾-in. choke, casing pressure 450-475 psi., tubing 100-175 psi., GOR 300 cu. ft.

NORTH CENTRAL TEXAS (DISTRICTS 9 & 7-B) WILDCAT FAILURES

Archer County: G. E. Kadane & Sons 1 J. M. Bloodworth "B," John Kelly Sur., 3 mi. W Scotland, dry, TD 5,540 ft., Caddo 5,196 ft.

Clay County: Star Oil Co., Inc., 1 H. E. Cnway, E. W. East Sur., 1 mi. N Shannon, dry, TD 5,988 ft., Caddo 5,472 ft.

Callahan County: Macmillan Petroleum Corp. 1 Josie Brown, Sec. 1, Blk. 2, SP Sur., 7 mi. SW Baird, dry, TD 4,504 ft., Caddo 3,913 ft., Ellenburger 4,443 ft.

Star Oil Co. 1 Josie Brown "D," Blk. 2, BBB&C Sur., 6 mi. S Clyde, dry, TD 1,566 ft., show oil 1,555-61 ft., pumped 1 bbl. oil a day.

Sunray Oil Co. 1 C. E. Aspin, Blk. 3,

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Comanche County: Sunshine & Gutow 1 L. S. Craig, Asa Hoxie Sur., 3 mi. S Proctor, dry, TD 3,292 ft., Marble Falls 2,778 ft., Ellenburger 3,045 ft.

Luling Oil & Gas Co. 1 Haile, Sec. 20, D&DA Sur., 3½ mi. S Gorman, dry, TD 2,809 ft., Marble Falls 2,600 ft.

Jones County: J. H. Moore 1 M. L. King, Napoleon Scott Sur. 15, 2 mi. S Leuders, dry, TD 1,861 ft., coal 1,816-22 ft.

Ungren & Frazier 1 L. T. Douthitt, Blk. 8, Lot 2, Fields & Montgomery Ranch, R. Grimes Sur., 3 mi. W Leuders, dry, TD 2,230 ft.

Knox County: J. F. Brown 1 T. J. Cartwright, Sec. 73, Blk. 45, H&TC Sur., ¾ mile NE Goree, dry, TD 1,862 ft.

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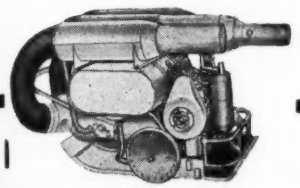

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HOUSTON

ROCKY MOUNTAIN

World's Deepest Pay Area Gets New Producing Zone

DENVER.—Drill-stem tests in the Mesa Verde at Pure Oil Co.'s West Poison Spider second well at 2 Unit, C NW NW 11-33n-84w, Natrona County, Wyoming, indicated the well would produce at the rate of 1,600 bbl. of 45.2°-gravity oil daily. The test was made between 9,230-88 ft. and oil flowed in 22 minutes with a gage of 50 bbl. on the 50-minute test. The well is at 9,288 ft., total depth, with the operator now running casing. The Mesa Verde (upper Cretaceous) was encountered at 7,285 ft., and at the present depth it is estimated there is another 600 ft. of the formation to be drilled. Top of the saturation was encountered at 9,230 ft. This well is ½ mile northwest of Pure's discovery well in this field, which was completed in May of this year flowing approximately 900 bbl. of oil daily through choke from the upper Frontier sand. Saturation was logged in the discovery well in a sand correlating with the producing zone in the present well, but only small amounts of oil were recovered on inconclusive tests and the well was deepened to 14,309 ft., total depth. The discovery well holds the record for the deepest producing well in the world.

There has been no previous commercial production from the Mesa Verde formation in the Rocky Mountain region, although a number of wells have had shows of both gas and oil in this formation. The Mesa Verde has not previously been considered of commercial possibilities, although several reservoir sands are present in the formation. Sinclair Wyoming Oil Co.'s wildcat in the Lysite area, 40 miles northwest of West Poison Spider, had numerous shows of gas in Mesa Verde sands but these were not commercial on continuous testing. Pure acquired the West Poison Spider block early last year, following seismic work in the area. The company is now unitizing a block 30 miles northwest of the West Poison Spider field, at Bad Water, Townships 38n and 39n, Ranges 88w, 89w, and 90w, for another deep test based on seismic work.

Failure of an important wildcat in western Colorado is a disappointment to operators holding acreage in the area. The well is Kerr-McGee Oil Industries and Phillips Petroleum Co.'s 1 Unit, CWL NE NW 8-8s-102w, in the Garmesa area, Garfield County, a projected Weber test on the block. The well found granite at 4,238 ft., with Shinarump at 4,165 ft. This was the first deep test on a structure where gas was discovered a number of years ago. The present well found an estimated 8,000,000 cu. ft. of gas per day in the Entrada between 3,516-60 ft. On a drill-stem test at 4,157-4,201 ft. in the Shinarump the well made only 30 ft. of drilling mud in 30 minutes.

Some saturation was logged in the Big Sand Coulee wildcat being drilled by Stanolind Oil & Gas Co. in C SE NE 8-55n-100w, Park County, Wyoming. The well is now at 13,109 ft., total depth, and on drill-stem test at 13,037-13,109 ft. made 180 ft. of mud with shows of dead black oil in 45 minutes. This well topped the Dinwoody at 12,895 ft. and at present depth is in the Tensleep formation. Slight oil shows were encountered in the Phosphoria formation. This is the deepest well to be drilled in this area of the Big Horn Basin.

Strong gas flows with high pressures are reported at the Superior Oil Co.'s deep wildcat in the Pacific Creek area at 1 Unit, SW NE SW 27-27n-103w, Sublette County, Wyoming. This well is now reported drilling below 12,210 ft., but formation tops and tests are withheld on the well pending completion. The well is reportedly projected as a Frontier formation (Cretaceous) test at depths estimated as deep as 16,000 ft. Top of the Mesa Verde formation was reported at 8,434 ft.

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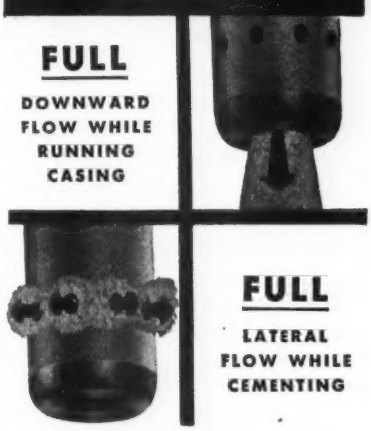

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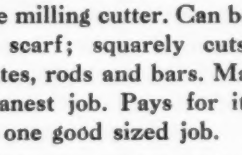

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WYOMING WILDCAT FAILURES

Hamilton Dome, Hot Springs County: Westates 21-1 Skelton, SE NW NW 21-44n-97w, TD 4,630 ft., PB 3,660 ft., dry, DST 3,617-60 ft., rec. 2,430 ft., sulfur water, Morrison 1,480 ft., Sundance 1,780 ft., Dinwoody 3,335 ft., Phosphoria 3,410 ft., Tensleep 3,620 ft., Amsden 3,940 ft., Madison 4,165 ft.

Terry Anticline, Laramie County: Sargeant & Allen 1 Warren Livestock, NE NE SW 11-12n-67w, TD 2,665 ft., dry, Muddy 1,900 ft., Dakota 2,200 ft., Frontier 1,850 ft.

Sargeant & Allen 2 Warren Livestock, SW SW NE 11-12n-67w, TD 2,812 ft., dry.

Horse Center, Park County: Superior Oil Co. 1 Unit, C NW NE 31-52n-101w, TD 4,466 ft., dry, Dinwoody 205 ft., Phosphoria 250 ft., Amsden 610 ft., Madison 834 ft.

MONTANA WILDCAT FAILURE

Wolf Creek, Carter County: Hunt Oil Co. 1 Gov't., C SW NE 6-8s-57e, TD 1,906 ft., dry.

OKLAHOMA

McClain County Gets New Gas-Distillate Pool

DANCIGER OIL & REFINING CO. 1 De Cordova, NW SE SW 35-8n-3w, McClain County, is opening a new gas-distillate area with production from sandy dolomite. Casing was set at 9,382 ft. and perforated at 9,377-80 ft. On a 3-hour test with ½-in. choke at the top and ⅜-in. choke at the bottom, the well flowed the 2,000-ft. water load in 7 minutes and at the end of the first hour was flowing at the rate of 18 bbl. per hour. At the end of the test the flow was 26 bbl. per hour.

Texas Pacific Coal & Oil Co. has had a showing of oil at 1 Smith, SE NW NE 30-5s-1e, southwest of Brock pool in Carter County. A 75-minute drill-stem test of Pennsylvanian sand at 3,202-12 ft. recovered 155 ft. of oil and 60 ft. of water. Operator has set casing at 3,204 ft.

The Seminole County wildcat, B. B. Blair 1 Madgett, NW SW NE 4-10n-6e, west of Keokut field, flowed 4½ bbl. per hour through ½-in. choke from Misner sand at 4,265-75 ft.

Superior Oil Co. tested the second Wilcox sand at 1 Long, SE SE SE 16-17n-7w, Kingfisher County wildcat, and found a show of gas. Casing was set to 8,917 ft. and a test through perforations at 8,775-8,824 ft. resulted in recovery of 2,800 ft. of gas-cut mud. Early drill-stem tests indicated gas and distillate from the Hunton, topped at 8,063 ft. and dolomite at 8,555 ft.

Mid-Continent Petroleum Corp. has a showing of oil in an outpost southwest of West Brock pool in Carter County. The well, 1 Wesley, SW SW SE 19-5s-1w, swabbed 3 bbl. of oil in 8 hours from perforations opposite a Deese sand at 4,490-4,502 ft.

OKLAHOMA SUCCESSFUL WILDCATS

Lincoln County: Smith 1 Jones, NW NW SE 35-12n-3e, pumped 19 bbl. of oil in 7 hours from unconformity at 4,937-47 ft., TD 5,609 ft.

Major County: Mazda 1 Gauley, NE NE NE 34-22n-10w, flowed 134 bbl. of oil per day through ⅝-in. tubing choke from Manning at 6,745-6,803 ft., TD 6,812 ft.

OKLAHOMA WILDCAT FAILURES

Cotton County: McCasland 1 Henderson, NE SW NE 34-3s-11w, dry, TD 2,063 ft., sand 1,483 ft.

Garvin County: Continental 3 Brooks, SW SE SE 36-3n-3e, dry, TD 960 ft., no tops reported.

Hughes County: Draper 2-B Epperley, NE NE NW 32-6n-8e, dry, TD 864 ft., first Calvin 660 ft., second Calvin 857 ft.

Lincoln County: Barrett 1 Merceiz, SE NE SW 7-13n-6e, dry, TD 4,462 ft., Hogshooter 1,900 ft., Checkerboard 2,285 ft., Oswego 3,100 ft., no Prue, Skinner 3,280 ft., Red Fork 3,418 ft., sand 3,470-3,520 ft., Bartlesville 3,590 ft., Bartlesville sand 3,620 ft., lime 3,720 ft., Mississippian Caney 3,888 ft., Mayes 3,990 ft., Woodford 4,174 ft., Hunton 4,214 ft., Sylvan 4,260 ft., Viola 4,348 ft., dolomite 4,390 ft., Wilcox 4,440 ft.

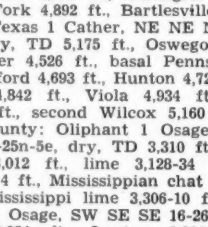
Amerada 1 McKeown, SE NE NW 5-16n-6e, dry, TD 3,850 ft., Oswego 2,853 ft., upper Prue 2,948 ft., lower Prue 2,990 ft., Verdigris 3,013 ft., Skinner 3,082 ft., Red Fork 3,220 ft., Inola 3,300 ft., Bartlesville 3,310 ft., Mississippi lime 3,525 ft., Woodford 3,666 ft., Sylvan 3,700 ft., Viola 3,748 ft., dense 3,784 ft., dolomite 3,792 ft., Wilcox 3,824 ft.

Logan County: Falcon-Seaboard 1 Sharp, SE SE SE 22-15n-1e, dry, TD 5,535 ft., Pawhuska 1,938 ft., Oread 2,090 ft., Tonkawa 2,300 ft., Avant 3,227 ft., Perry 3,268 ft., Hogshooter 3,796 ft., Layton 3,832 ft., conglomerate 4,063 ft., Checkerboard 4,083 ft., Big lime-Oswego 4,581 ft., Prue 4,700 ft., Verdigris 4,750 ft., Red Fork 4,892 ft., Bartlesville 4,962 ft.

South Texas 1 Cather, NE NE NW 1-16n-1e, dry, TD 5,175 ft., Oswego 4,273 ft., Skinner 4,526 ft., basal Pennsylvanian-Woodford 4,693 ft., Hunton 4,723 ft., Sylvan 4,842 ft., Viola 4,934 ft., Wilcox 5,014 ft., second Wilcox 5,160 ft.

Osage County: Oliphant 1 Osage, NE SW SW 7-25n-5e, dry, TD 3,310 ft., Oswego 2,946-3,012 ft., lime 3,128-34 ft., Inola 3,204-14 ft., Mississippian chat 3,274-3,306 ft., Mississippi lime 3,306-10 ft.

Peters 1 Osage, SW SE SE 16-26n-5e, dry, TD 3,024 ft., Layton 2,804-2,288 ft., Checkerboard 2,432 ft., Big lime 2,554 ft.,



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Payne County: Howell 1 Houck, NE NE SE 20-20n-2e, dry, TD 4,936 ft., Mississippi lime 4,520 ft., Woodford 4,714 ft., Sylvan 4,750 ft., Viola 4,806 ft., Wilcox 4,874 ft., second Wilcox 4,917-32 ft.

Seminole County: Rogers 1-A Davis, SE SE SW 9-8n-7e, dry, TD 4,200 ft., upper Calvin 1,780-1,830 ft., lower Calvin 2,060-2,110 ft., coal 2,300 ft., Allen 2,530-40 ft., Booch 3,142 ft., Booch sand 3,150-60 ft., Cromwell 3,232-3,310 ft., Woodford 3,890 ft., Hunton 3,956 ft., Sylvan 4,040 ft., Viola 4,110 ft., dense 4,160 ft., dolomite 4,180 ft., Wilcox 4,197 ft.

Stephens County: Carter 1 Emmons, C SE NE 26-2n-9w, dry, TD 7,785 ft., no tops reported.

Tillman County: McCasland 1 Wittmeyer, SW NE NE 20-1s-18w, dry, TD 4,507 ft., Canyon 3,530 ft.

KANSAS

Stafford County Gets Possible Pool Opener

THE northwestern part of Stafford County has a possible pool opener at R. L. Williams 1 Pritchard, NE NE NE 22-22s-14w, about 3 miles southwest of Curtis pool. The Lansing was called at 3,456 ft. and a 27-minute drill-stem test at 3,481-87 ft. recovered 30 ft. of oil and 30 ft. of oil and gas-cut mud. Two other 30-minute tests were run. The recovery at 3,494-99 ft. was 200 ft. of oil-cut mud while recovery at 3,634-44 ft. was 20 ft. of oil-cut mud. The Arbuckle was topped at 3,837 ft. and casing has been set at total depth of 3,843 ft. The well is almost 1½ miles northeast of Nellie pool, opened last July by J. M. Huber 1 Syms with a potential of 480 bbl. per day from the Lansing-Kansas City.

In Rooks County, W. L. Hartman 1 Webster, SW SW SE 34-9s-19w, had a recovery of 34 ft. of oil-cut mud and a show of free oil on a 45-minute drill-stem test of the Arbuckle at 3,640-50 ft. Casing has been set at 3,642 ft. Well is 1 mile south of Zurich Townsite pool.

Cowley County has a new Layton sand pool at Wolf Creek Drilling Co. et al 1 Bynum, SW SW SE 18-32s-6e, about 9 miles east of Winfield. The Layton was called at 2,253 ft. with a saturated section at 2,286-92 ft. Well is making 12 bbl. per day natural and will be shot.

J. M. Huber Corp. et al 1 Weigel, NW NW SE 19-12s-16w, Ellis County, has been completed with a potential of 16 bbl. per day from the Lansing-Kansas City. The Lansing was called at 3,343 ft. and well was completed through perforations at 3,368-76 ft. The Arbuckle was topped at 3,633 ft. and hole carried to 3,662 ft.

The Rooks County wildcat, Phillips Petroleum Co. and Cities Service Oil Co. 1 Nettie, SE SE SW 34-9s-17w, is being completed as a Lansing-Kansas City well through perforations at 3,243-68 ft. Potential is 168 bbl. per day. The well was drilled to 3,545 ft. in the Arbuckle but found only a small amount of oil in the lower formation. The new discovery is about 4 miles southwest of Westhusin pool.

For the week, a total of 76 new locations were announced. Barton County led with 12 new spots, followed by Russell with 11, and Butler with 10.

KANSAS SUCCESSFUL WILDCATS

Ellis County: J. M. Huber and Deep Rock Oil Co. et al 1 Weigel, NW NW SE 19-12s-16w, pumped 16 bbl. of oil per day from Lansing at 3,368-76 ft.; anhydrite 1,265 ft., Heebner 3,303 ft., Dodge 3,315 ft., Lansing 3,343 ft., conglomerate 3,620 ft., Arbuckle 3,633 ft., TD 3,662 ft.

Nemaha County: Carter Oil Co. 1 Strahm, SW SW NW 27-2s-14e, pumped 16 bbl. of 23°-gravity oil per day from Hunton at 2,877-79 ft.; Howard 878 ft., Topeka 910 ft., lower Kansas City 1,316 ft., Cherokee 1,925 ft., conglomerate 2,440 ft., Kinderhook 2,599 ft., TD 2,879 ft.

Sumner County: Alpine Oil & Royalty 1 Douglas, C E/2 SE NW 23-34s-2w, pumped 50 bbl. of 47°-gravity oil per day from Simpson at 4,475-81 ft.; Stalnaker 2,937 ft., Kansas City 3,412 ft., Mississippian 4,059 ft., TD 4,481 ft.

KANSAS WILDCAT FAILURES

Barton County: D. T. Ingling 1 Unruh, SE SE SE 11-20s-14w, dry, TD 3,571 ft., anhydrite 794 ft., Topeka 2,897 ft., Heebner 3,134 ft., Lansing 3,239 ft., conglomerate 3,471 ft., Arbuckle 3,551 ft.

Butler County: E. H. Adair 1 Quells, NE NW SE 8-29s-5e, dry, TD 2,882 ft., Lansing 1,870 ft., Kansas City 2,210 ft., Mississippian 2,849 ft.

Cowley County: Rex & Morris 1 Swainstuber, NE NW SW 8-30s-5e, dry, TD 2,895 ft., Stalnaker 1,880 ft., Kansas City 2,220 ft., Mississippian 2,870 ft.

Ellis County: Jones & Shelburne & Farmer 1 Gottschalk, SW NW NE 36-15s-18w, dry, TD 3,490 ft., anhydrite 1,052 ft., Heebner 3,145 ft., Lansing 3,193 ft., basal Kansas City 3,427 ft., conglomerate 3,446 ft., Arbuckle 3,482 ft.

Reno County: Stagg Drilling Co. 1 Russell, NW SW NW 33-22s-10w, dry, TD 3,700 ft., anhydrite 403 ft., Kansas City 3,208 ft., conglomerate 3,519 ft., Kinderhook 3,539 ft., Viola 3,584 ft., Simpson 3,618 ft., Simpson sand 3,635 ft., Arbuckle 3,688 ft.

Rooks County: Sam Pack 1 Shaw-Miller, SE SE SE 3-8s-20w, dry, TD 3,470 ft., anhydrite 1,505 ft., Topeka 2,926 ft., Heebner 3,147 ft., Lansing 3,186 ft., Arbuckle 3,453 ft.

Continental Oil Co. et al 1 Schmeider, SE SE NW 12-8s-20w, dry, TD 3,505 ft., Lansing 3,165 ft., Arbuckle 3,455 ft.

Doley Oil Co. 1 Thomas, SW SW SW 29-10s-20w, dry, TD 3,771 ft., anhydrite 1,589 ft., Topeka 3,164 ft., Heebner 3,362 ft., Toronto 3,385 ft., Lansing 3,400 ft., basal Kansas City 3,625 ft., conglomerate 3,671 ft., reworked Simpson shale 3,706 ft., Simpson dolomite 3,715 ft., reworked Arbuckle 3,719 ft., solid Arbuckle 3,755 ft.

Rush County: Virginia Drilling Co. 1 Wollman, NW NW NW 20-17s-19w, dry, TD 3,974 ft., anhydrite 1,375 ft., Dodge 3,494 ft., Kansas City 3,554 ft., conglomerate 3,876 ft., Viola 3,896 ft., Arbuckle 3,944 ft.

Stafford County: George Johnston, Jr., 1 Harter Estate, SE SW SE, 8-21s-13w, dry, TD 3,706 ft., anhydrite 795 ft., Lansing 3,360 ft., basal Kansas City 3,585 ft., conglomerate 3,603 ft., Simpson 3,617 ft.

Sumner County: Sterling Oil Co. of Okla., Inc., 1 Miksch, SW SW NE 8-33s-1e, dry, TD 4,343 ft., Mississippian 3,800 ft., upper Stalnaker 2,660 ft., Stalnaker 2,724 ft., Kansas City 3,111 ft., basal Kansas City 3,392 ft., Oswega 3,455 ft., Kinderhook 4,177 ft., Simpson sand 4,233. ft., Arbuckle 4,318 ft.

MISSISSIPPI

273-Bbl. Well Completed In Baxterville Field

JACKSON.—Gulf Refining Co. 16 J. M. Andrews, Section 5-1n-16w, in Baxterville field, Lamar County, has been completed for an initial production of 273 bbl. of 16.4°-gravity oil through 13/64-in. choke per day. Total depth is 8,856 ft., with perforations at 8,833-56 ft., and 8,744-8,856 ft.

Also in Baxterville field, Sun Oil Co. 4 J. S. Moody, 31-2n-16w, was completed through perforations at 8,773-8,818 ft., flowing at the rate of 172 bbl. per day through ⅜-in. choke. Total depth is 8,850 ft. in sidetracked hole.

In LaGrange field, Adams County, Magnolia Petroleum Co. has completed 4 Reale heirs, 92-7n-2w, pumping 125 bbl. of oil per day, through perforations at 6,237-43 ft. Total depth is 6,312 ft. Top Baker sand 6,237 ft.

Humble Oil & Refining Co. B-9 G. M. & O. Land Co., 14-9n-8w, in Yellow Creek field, Wayne County, has been completed pumping 168 bbl. of 18.7°-gravity oil per day, through perforations at 5,126-58 ft.

One wildcat location in Tippah County was reported this week for Mississippi, while 4 development locations were reported, 1 each in Baxterville field, Lamar County; Carthage Point field; LaGrange field, and LaGrange field-South, Adams County.

MISSISSIPPI WILDCAT FAILURES

Greene County: Humble Oil & Refg. Co. 1 Lottie Grantham, 28-5n-8w, dry, TD 8,500 ft.

Lincoln County: McAlester Fuel Oil Co. 1 F. H. & M. J. Hartman, 22-6n-9e, dry, TD 11,040 ft.

Perry County: Cox & Hamon 1 Masonite Corp., 21-5n-11w, dry, TD 9,020 ft.

CALIFORNIA

Guijarral Hills' Second Well Good for 1,500 Bbl.

LOS ANGELES.—Standard Oil Co. of California has reported completion of the second well in the new Polvadero field in the Guijarral Hills area of Fresno County. The well, 35-7F Fee, 35-20s-16e, came in flowing at the rate of 1,500 bbl. daily through a ½-in. choke. Production was from the Leda sand at the interval 8,716-60 ft. Standard's new producer is approximately ¾ mile northeast of Barnsdall Oil Corp.'s discovery well, and is equally as good from a production standpoint as the discovery which flowed at a rate above 1,000 bbl. daily. The new field, located on a downdip from the Pleasant Valley field, is believed to be of major importance as a result of the performance of the two producers so far completed. It is believed to be a stratigraphic trap formed by a pinch out of the Leda sand against the Pleasant Valley structure. The field has also provided the first commercial production from the Leda sand in California.

The San Joaquin Valley also claimed attention last week as the result of reports that Hancock Oil Co.'s exploratory venture in the Gosford District, near the Ten Section field, Kern County, had cored oil showings of importance. The wildcat, 85-23 Kern County Land Co., 23-30s-26e, currently is drilling ahead below the 8,450-ft. level, with the showings apparently found between 7,961 ft. and the present depth. Although official reports of the well's findings have not yet been released by Hancock, oil operators in the San Joaquin Valley seem to be generally in agreement that the company is on the verge of a new oil strike.

Jergins Oil Co. and North American Oil Co., which in recent weeks have been chalking up new producers regularly in the San Ardo area of Monterey County, last week added still another good producer there. The new well is the 150-12 Orradre, 12-23s-10e, which was completed at a depth of 2,130 ft. for an estimated 150 bbl. daily. The Jergins-North American combination and The Texas Co. now have several good producers in the San Ardo area.

The entire Salinas Valley, of which the San Ardo area is a small part, is considered to be of great significance, particularly in light of the San Ardo wells, since it is the northern boundary of a large trend of sedimentary basins which is bordered on the south by the Cuyama Valley. Previously, little exploration had been done along this trend, but recent discoveries both at San Ardo and in the Cuyama Valley have now convinced California operators that all the basins along the trend, which roughly parallels the trend of producing fields in the San Joaquin Valley, are excellent prospective oil producing regions

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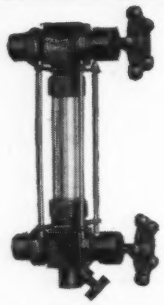

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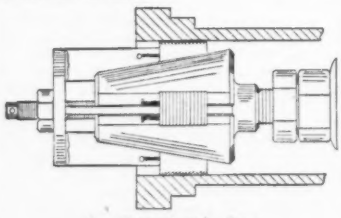

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CALIFORNIA SUCCESSFUL WILDCATS

Ventura County, Ojai Area: Richfield Oil Corp. 61 Ojai, 14-4n-22w, flowed 121 bbl. in 17½ hr., perf. 1,495-3,497 ft., elev. 1,714 ft., TD 3,500 ft.

Timber Canyon Area: Richfield Oil Corp. 1 E. P. Clark, 13-4n-21w, pumped 30 bbl. daily, gravity 35.7°, water cut 14 per cent, ¼-in. choke, elev. 2,914 ft., TD 3,853 ft.

CALIFORNIA WILDCAT FAILURES

Contra Costa Area, Crockett Area: Standard Oil Co. of California 1 Fernendez Comm., 21-2n-3w, dry, elev. 341 ft., TD 6,607 ft.

Fresno County, Guijarral Hills Area: Universal Consolidated Oil Co. 1 Orr, 2-21s-16e, dry in hard sandstone, elev. 578 ft., top Leda zone 9,125 ft., TD 9,170 ft.

Kern County, Poso Creek Area: Golden Bear Oil Co. 1 Buckley, 23-26s-27e, dry in gray sand, elev. 970 ft., TD 2,506 ft.

Tejon Area: T. and E. Drilling Co. 1 Tejon Claire, 36-32s-29e, dry in granite, elev. 891 ft., Santa Margarita 363 ft., Granite 1,020 ft., TD 1,047 ft.

Los Angeles County, Placerita Canyon Area: Nelson-Phillips Oil Co. 3 Swall-Ferrier, 31-4n-15w, dry, elev. 1,487 ft., TD 844 ft.

Orange County, Brea Area: Pacific-Western Oil Corp. 2-1 Brea Comm. dry, elev. unknown, TD 8,476 ft.

Yolo County, Dixon Area: Seaboard Oil Co. 1 Fraser, 33-7n-4e, dry, elev. 14 ft., Nortonville 2,982 ft., Domengine 3,076 ft., Lignite sand 3,524 ft., TD 3,609 ft.

APPALACHIAN FIELD

Portland District Gets Deep Wildcat Test

PITTSBURGH.—In Portland district, Preston County, West Virginia, Hope Natural Gas Co. made location for a deep test, No. 9315 P. S. Pyles, elevation 2,197 ft., on the waters of Saltlick Creek in the Terra Alta section. The location is on the Kingwood Quadrangle 3.65 miles south of Lat. 39°, 30′, 3.35 miles west of Long. 79°, 30′, and approximately 1¾ miles northeast of the recently completed successful Oriskany wildcat on the Martin farm. This same company is drilling a Clinton test in Grant district, Ritchie County, No. 9300 Jessie Powell, elevation 1,006 ft., on the waters of Myers Run. This well is on the Elizabeth Quadrangle 0.8 mile south of Lat. 39°, 15′, and 0.35 mile west of Long. 81°, 15′; drilling is at 1,450 ft. In Ripley district, Jackson County, South Penn Natural Gas Co. No. 1 N. S. King, elevation 750 ft., was drilled through the Oriskany sand 4,720-4,750 ft. with a show of gas 4,736-4,739 ft. and is now drilling at 4,751 ft.

New locations reported in West Virginia were 30: Jefferson district, Kanawha County; McKim district, Pleasants County; Portland district, Preston County; Clear Fork, Marsh Fork and Trap Hill districts, Raleigh County; Clay, Grant and Murphy districts, Ritchie County; Harper and Reedy districts, Roane County; McElroy district, Tyler County; Meade district, Upshur County; Butler, Grant, Lincoln and Union districts, Wayne County; Reedy district, Wirt County; Harris, Lubeck and Walker districts, Wood County; and Oceana district, Wyoming County.

In Georges Township, Fayette County, Pennsylvania, on the Chestnut Ridge anticline, New Penn Development Corp.-William E. Snee et al acidized No. 2 Mary I. Smith at which drilling operations were completed a year ago with gas gaging 696,000 cu. ft. in the Onondaga chert from 7,183-198 ft. and without gas in the Oriskany sand. The well has been in production for the past year and after acidizing this week the open flow recorded was 5,000,000 cu. ft. Other wells in this area may receive similar treatment.

New locations reported in Pennsylvania were five: Boggs, Kiskiminetas and Plumcreek townships, Armstrong County; and Conemaugh Ttownship, Indiana County.

SOUTH LOUISIANA

Humble Well Opens Second Gulf Field

NEW ORLEANS.—The fourth oil well in the tidelands areas, and the second producing oil field in the Gulf of Mexico off Grand Isle has been opened by Humble Oil & Refining Co. The discovery well, A-1 Caminada Pass, State Lease 799, Caminada Pass Account No. 4, in Block 16, State Tract 1114, flowed at rate of 182 bbl. of 37.8°-gravity oil per day through a 5/32-in. choke through perforations at 4,584-96 ft. Tubing pressure 625 psi., and gas-oil ratio 233. This well is located approximately 5½ miles offshore from Caminada Pass at the west end of Grand Isle.

Atlantic Refining Co. 1 Kirby Lumber Co. has opened a new oil field about 4 miles east of the Texas-Louisiana state line in Beauregard Parish, Section 17-5s-13w, approximately 4 miles west of Bivens production. Drilled to a total depth of 9,806 ft., the well flowed 96 per cent oil and 4 per cent wash water while cleaning through a 6/64-in. choke. Flowing pressure on tubing 590 psi., casing pressure 600 psi. Operators are preparing to make a potential flow test. Production is through perforations at 9,324-30 ft.

Magnolia Petroleum Co. 1 State Lease 838, Block 45, in the Eugene Island area, 12 miles from the nearest point of the Louisiana shore line, has been completed to open another gas-condensate field off Iberia Parish. Total depth is 13,636 ft., in a deviated hole. Top of pay 11,351 ft. The well flowed 59.69 bbl. of 45.4°-gravity condensate per day along with 1,260,000 cu. ft. of

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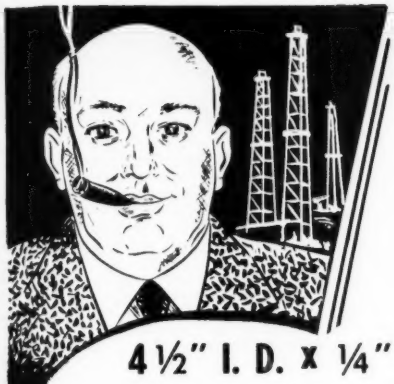

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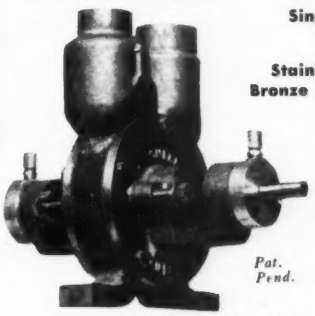

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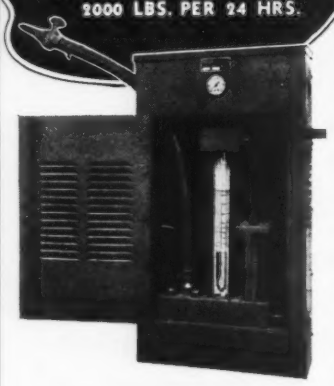

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gas daily, through a ⅜-in. choke. Flowing pressure on tubing was 920 psi., gas-condensate ratio 180,000. Production is through perforations at 11,351-58 ft.

In Jefferson Davis Parish, approximately 1 mile southwest of West Tepetate production, W. T. Burton 1 Anna Byam Keith, opened a new oil-producing area. Drilled to a total depth of 9,645 ft., with 7-in. casing cemented at 8,480 ft., this well flowed 257 bbl. of oil per day through a 10/64-in. choke, gas-oil ratio 844. Oil sands were reported in the Ortego section from 8,397-8,441 ft.

Oil shows were reported in Humble 1 Atchafalaya Land Co., 1-15s-11e, 4 miles southwest of West Lake Verret production, in St. Martin Parish. This well is being drilled below 12,200 ft., and oil shows were reported at 10,830-45 ft., and gas shows in cores taken at 11,648-50 ft.

The 14 new locations reported this week for South Louisiana included 2 wildcat starts, 1 each in Allen and Livingston parishes. Two successful exploratory tests opened two oil fields, 1 each in Beauregard and Iberia parishes; one wildcat was dry, in Lafourche Parish.

SOUTH LOUISIANA SUCCESSFUL WILDCATS

Beauregard Parish: New oil discovery, South Bancroft — Roeser & Pendleton, Inc., et al 1 Columbia Land & Timber Co., in 27-6s-13w, south of Bancroft field, TD 11,090 ft., top sand 10,242 ft., perf. 10,242-252 ft., IP: 223 bbl. oil per day through ¼-in. choke, GOR 3,358, TP 1,325 psi., gravity 46.7°.

Iberia Parish: New oil discovery, Block 45, Eugene Island area—Magnolia Petroleum Co. 1 State Lease 838, Block 45, 12 mi. SW of Rabbit Island field, 12 mi. S of nearest point on shore line, TD 13,636 ft., in sidetracked hole, top sand 11,351 ft., perf. 11,351-58 ft., IP: 60 bbl. oil per day through ⅜-in. choke, and 1,260,000 cu. ft. gas per day, GOR 180,000, gravity 45.4°, TP 920 psi.

SOUTH LOUISIANA WILDCAT FAILURE

Lafourche Parish: The Pure Oil Co. 1 Bouterie hrs., in Lafourche townsite area, 7-15s-17e, dry, TD 12,105 ft.

PERMIAN BASIN

Gulf Wildcat Test Continues Swabbing

MIDLAND.—Gulf Oil Corp. 1-E Wilson Bryant, central Midland County wildcat, last week had not yet tested the Fusselman section of the Silurian, but perforated in the Pennsylvanian at 9,340-9,410 ft., and was swabbing after acid treatment. This section had shown some signs of oil while drilling, and a previous drill-stem test recovered 1,800 ft. of gas-cut mud with a slight show of oil. When this section has been thoroughly tested, it will drill cement out to around 12,800 ft. and test the Silurian between 12,645-12,767 ft., according to last report.

The Texas Co. 1 Clarence Scharbauer, southwest of Midland, drill-stem tested the Ellenburger from 13,116-160 ft., to recover 540 ft. of water blanket and 180 ft. of drilling mud with no shows. Previous tests of the Ellenburger had shown some oil possibilities. It was drilling ahead below 13,205 ft. On the above drill-stem test, the tool was open 34 minutes. It produced a weak blow of air the first 10 minutes and died. The tool was opened again and another blow was maintained for 7 minutes. Southeast of Midland, Tex Harvey Oil Co. 1 Floyd recovered 300 ft. of drilling mud and 870 ft. of slightly gas-cut salt water on a 3 hour and 40-minute test from 11,702-781 ft., in the Fusselman section of the Silurian. It drilled ahead below 11,800 ft., and was thought to be entering the Simpson section of the middle Ordovician.

In Scurry County, Standard Oil Co. of Texas completed its 1 Jesse Brown, Pennsylvanian limestone discovery 9 miles northwest of Snyder, for 532 bbl. of 45.5°-gravity oil a day through ¼-in. choke. The well produced from open hole at 6,333-6,414 ft., total depth, with gas-oil ratio of 1,225 cu. ft. and pressures of 725 psi. on casing and 1,030 psi. on tubing.

Sun Oil Co. 2 Emil Schattel ran its first drill-stem test of the Ellenburger between 7,973-75 ft., then squeezed perforations. Length of the test was not reported, but it was said to have made a fair blow of air for 20 minutes and the recovery was 120 ft. of mud. A drill-stem test from 7,995-8,010 ft., open 1 hour, recovered 200 ft. of water cushion, 1,200 ft. of cushion cut with gas, 200 ft. of oil and gas-cut mud, 220 ft. of oil and gas-cut sulfur water, and 100 ft. of salty sulfur water. Casing was to be set at 8,010 ft., total depth, after electrical surveys.

Texas Pacific Coal & Oil Co. 1-F University, Section 13, Block 13, University Survey, on the north side of Shafter Lake field, and north of Sinclair-Prairie 2-154 University, new Ellenburger discovery for the field, is to drill ahead to test the Ellenburger, expected around 10,560 ft. The 1-F University has indicated production in the Clear Fork, Wolfcamp and the Pennsylvanian. On last report it was drilling below 10,400 ft. in Devonian lime. Sinclair's discovery was bottomed at 11,898 ft., and running casing for completion trys in the upper Ellenburger section above the water table.

In western Floyd County, General American Oil Co. 2-B Carmichael, Section 18, Block K, TT Survey, east offset to the company's discovery of Arick field (Hale County), recovered 300 ft. of oil and gas-cut drilling mud on a 2-hour drill-stem test of the Pennsylvanian lime from 5,775-5,856 ft. It topped the reef lime at 5,775 ft. Operators cored ahead after the test.

A new wildcat operation for Brewster County was announced by Weldon and J. D. Lancaster, of McCamey. The proposed 3,500-ft. cable-tool test will be the 1 Earl McElroy, 330 ft. from north and 900

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ft. from east lines, southwest quarter, Section 1, Block 364, of the Andred Sargeant Survey. Approximate location is 50 miles south of Alpine.

WEST TEXAS (DISTRICTS 8 & 7-C) SUCCESSFUL WILDCATS

Coke County: Sun Oil Co. 1 P. W. Millican, Sec. 230, Blk. 2, H&TC Sur., 10 mi. W Robert Lee, flowed 576 bbl. 45.4°-gravity oil in 24 hours, ¼-in. choke, GOR 1,075 cu. ft., reef lime 5,955-71 ft., TD, tubing pressure 1,075 psi., casing 510 psi., elevation 3,136 ft.

Gaines County: Honolulu Oil Corp. 1 T. S. Riley, Sec. 123, Blk. G, WTRR Sur., 8 mi. NE Seminole, flowed 775,000 cu. ft. gas from Yates, topped 3,436 ft., TD 7,542 ft., PB 3,597 ft., elevation 3,326 ft.

WEST TEXAS (DISTRICTS 8 & 7-C) WILDCAT FAILURES

Coke County: Southern Minerals 1 Fred McCade, Sec. 25, Blk. Z, D&SW Sur., 4½ mi. NE Divide, dry, TD 7,355 ft., Strawn 6,858 ft., Ellenburger 7,335 ft., elevation 2,507 ft.

Concho County: Humble 1 Max Ulrich, Sec. 241, A. Schumann Sur., 7 mi. E Paint Rock, dry, TD 3,715 ft., Palo Pinto 3,058 ft., Ellenburger 3,493 ft., elevation 1,632 ft.

Crockett County: Amerada Petroleum Corp. 1-C Shannon, League 2, Archer CSL, 2 mi. NE Olson field, dry, TD 8,018 ft., lime 2,325 ft., Simpson 7,295 ft., Ellenburger 7,920 ft., elevation 2,562 ft.

Irion County: Hassie Hunt 1-M W. M. Noelke, Tom Green CSL 1, dry, TD 7,918 ft., recovered gas-cut mud at 6,990-7,066 and 7,725-7,836 ft., Ellenburger 7,740 ft., elevation 2,467 ft.

Presidio County: Wesley W. West 1 Presidio Trust, Sec. 1, Blk 1, D&P Sur., 4 mi. NE Presidio, dry, TD 8,002 ft., no tops reported, elevation 2,788 ft.

SOUTHEASTERN NEW MEXICO

HOBBS.—Four active outposts to the Crossroads Devonian production area continue to drill toward 12,000 ft. Skelly Oil Co. 1 U. D. Sawyer, 33-9s-36e, was drilling in the lower Pennsylvanian below 11,585 ft.; Mid-Continent Petroleum Corp. 1-B U. D. Sawyer, 34-9s-36e, had progressed past 11,610 ft.; Mid-Continent 1 Dessie Sawyer, 27-9s-36e, was going ahead below 11,380 ft.; Magnolia Petroleum Co. 1-C Santa Fe-Pacific, 26-9s-36e, struck chert below 11,665 ft. and was continuing.

Lea County.—Stanolind Oil & Gas Co. et al 1-U State, 2-20s-38e, continues to drill below 9,270 ft. in lime and shale, and Phillips Petroleum Co. 1 Shipp, approximately 3 miles west of the Hobbs field, in 20-18s-37e, is scheduled to drill ahead after machinery repairs. The well is shut down at 7,378 ft.

Continental Oil Co. 1-B-29 Warren Unit, 29-20s-38e, drill-stem tested the Devonian at 8,267-8,345 ft., recovered more than 725 ft. of sulfur water but no shows of oil or gas, and will drill deeper.

Tide Water Associated Oil Co. will attempt to extend the Drinkard field limits at its 1 Williamson, C NW NW 23-21s-37e, scheduled to go to 6,000 ft.

Chaves County.—Martin Yates has staked an interesting shallow wildcat in Section 27-15s-29e. The 1,800-ft. test will try for upper Permian production.

the Max Bell Group has also staked location for its first well, P. S. & P. Redwater 1, LSD 13 36-57-22w4, about half a mile west of Anglo-Home 2, and is moving in rig.

The three new sites are located 2 miles due west of Imperial-Redwater 1 discovery. They are on leases recently acquired from the government at bonus costs of nearly a million dollars.

Hanna.—The Hanna Petroleums 3 well, LSD 14 5-31-14w4, where a tragic fire occurred while drill pipe was being pulled after drill-stem test of the Lower Cretaceous, has pulled remaining pipe from the hole. Content of pipe consisted of 240 ft. of approximately 36°-gravity crude oil and 8 ft. of salt water.

Halfway Lake.—The Pacific-Sunray 1 well, LSD 9 19-59-23w4, located about 18 miles northwest of Imperial's Redwater discovery well, has an indicated gas discovery in the Lower Cretaceous. Two drill-stem tests were run in the Lower Cretaceous section from 2,900-40 ft. The natural-gas flow rate through ½-in. choke was 3,000,000 cu. ft. daily, with no water or oil showing. The well has since cored to around 3,102 ft., searching for the main objective, the Devonian.

Dunmore. — California-Standard Co. has staked location for another gas test in the Dunmore area. The new start, 44 Dunmore-Province, LSD 7 20-10-5w4, is located about 6 miles southwest of nearest gas production. Objective will be the Basal Ellis sand, with an approximate completion depth of around 3,300 ft. Drilling will commence as soon as

ILLINOIS

Dahlgren Pool Gets Good North Extension

MATTOON.—Ross Bartmess has given Dahlgren pool of Hamilton County a good extension to the north at 1 Whipple, NW NW SW 23-3s-5e. Operator is cleaning out and testing after an acid treatment of the McClosky pay at 3,292-3,304 ft. Casing was set at 3,285 ft. The well is reported to be swabbing at the rate of 12 bbl. per hour.

In Clay County, J. L. Black is pump testing the McClosky at 1 Edward Hammer, SW NE SW 5-4n-6e, about 4 miles northwest of Louisville. Casing was set on bottom of hole at 2,760 ft. Late pumping reports show production of about 175 bbl. per day.

The Christian County wildcat, National Associated Petroleum 1 J. R. Lawrence, SE NE SE 9-13n-1e, is pump testing the Devonian and is producing an estimated 200 bbl. per day. National Associated Petroleum opened Assumption pool in October with production of 31 bbl. per day from the Devonian at 1 C. G. Sincox, NE NW NE 29-13n-1e. The same operator has a northeast offset to the Sincox well drilling at 1,582 ft. and Brown & Witschy 1 James McLeod, NW NE NW 21-13n-1e, is a new location in the area.

In the northeastern part of Jefferson County, Gulf Refining Co. has completed 1 W. D. Holloway, NW SE NW 21-1s-4e, near East Divide pool. Production is from the McClosky at 2,804-07 ft. and was gaged at 277 bbl. per day.

ILLINOIS SUCCESSFUL WILDCATS

Crawford County: R. R. Wells 1 Prather, SE SW SE 3-6n-11w, IP 211,000 cu. ft. gas, Pennsylvania sand 672-89 ft., TD 2,973 ft.

Richland County: Bell Brothers 1 Iaggi, NE NW SW 26-5n-10e, IP 84 bbl., O'Hara 2,904-24 ft., TD 2,973 ft.

ILLINOIS WILDCAT FAILURES

Clay County: Coffman & Bullock 1 Brooks, SE SE SE 19-3n-7e, dry, TD 3,008 ft.

Franklin County: Menhall 1 Hart, SW SW SW 34-6s-4e, dry, TD 3,236 ft.

Jasper County: F. R. Stocker 1 Harrison, NE NE SW 32-7n-14w, dry, TD 2,649 ft.

Macon County: Breeze & Boyle 1 Harser, NW SE SE 27-17n-3e, dry, TD 2,308 ft.

Madison County: LeRoy Wildish 1 Evans, NE NW NE 7-5n-7w, dry, TD 608 ft.

Richland County: Affeld & Marvin 1 O. Crosby, NW NE NE 18-4n-10e, dry, TD 2,651 ft.

M. & M. Drilling Co. 1 Federal Land Bank, SE NE SW 27-5n-14w, dry, TD 3,011 ft.

Wayne County: Ashland Oil & Refining Co. 1 H. Kennard, SE SE SE 20-1s-9e, dry, TD 3,335 ft.

White County: E. A. Obering 1 C. L. Metcalf, SW SE NW 5-5s-8e, dry, TD 3,573 ft.

CANADIAN FIELDS

Woodbend May Get D-2 Production

CALGARY.—Imperial Oil, Ltd., has obtained a highly promising show of oil in the D2 zone of Devonian at Imperial-Leduc No. 11, LSD 3 16-51-26w4, located about half mile from the company's No. 4 D3 zone producer in the Woodbend Oilfield. A 26-minute drill-stem test of the interval 4,895-4,980 ft. gave a natural gas flow rate of 700,000 cu. ft. daily, plus a flow of oil reaching the surface in 18 minutes. No water showed. The D2 test at No. 11 is the best yet attained in that horizon of the Woodbend oil field.

Redwater.—Anglo Canadian Oil Co. and Home Oil Co. have staked sites for two wells in the Redwater area, northeast of Edmonton. Anglo-Home-Redwater No. 1, LSD 16 36-57-22w4, is completing rig up, and will spud in the next few days. Anglo-Home-Redwater No. 2, LSD 15 36-57-22w4, is a quarter of a mile west of No. 1, is rigging up, will spud in about a week.

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Leduc.—McConset Leduc 1, LSD 16 13-50-27w4, about ½ mile southwest of current Leduc producing limits, has reached and drill stem tested top of D2 zone. D2 showed at 5,054 ft. Drill-stem test at this wildcat gave a recovery of 30 ft. of mud. The well has since cored to 5,140 ft. and is running a further drill-stem test.

OHIO, KENTUCKY

Flint Ridge Pool Gets New 87-Bbl. Well

COLUMBUS.—The Clinton Oil Co. 4 Lake & McCracken, Section 13, Hopewell Township, Licking County, should revive interest in the old Flint Ridge pool. A good oil showing in the Clinton sand was shot and the well flowed 87 bbl. in 24 hours. This area, like other parts of the Corning Grade field, was never drilled up.

The North Wellington pool was extended a location to the east with a fair well. The Ohio Fuel 3 V. Y. Young, Lot 5, Wellington Township, Lorain County, gaged 475,000 cu. ft. natural from Clinton sand at 2,359-66 ft.

In Parma Township, Cuyahoga County, Harry Dempsey et al drilled in their 3 Fred Walther, Lot 41, with 420,000 cu. ft. natural from Oriskany sand at 1,795-1,839 ft.

The third attempt to open a pool in Washington Township, Stark County, ended in a failure. The Stark O. & G. Co. 1 Geo. Wallace, Section 25, found the Clinton sand at 5,300-92 ft. with only a small show of gas at 5,350-52 ft.

The Fruehauf Trailer Co. is drilling a wildcat on Anton Klingshirn in Section 8, Avon Township, Lorain County.

Perry County has taken over the lead in drilling activity from Stark and Muskingum counties with 32 wells drilling and 9 rigs up. Southern Hopewell Township and northern Reading Township is now the most active part.

Locations for the week were up again to 44 from 15 counties. Washington County led with 10 and was followed by Meigs with 7, and Athens with 6. Cambridge field with nine completions out of a total of 29 led over Stewart which had eight.

OHIO SUCCESSFUL WILDCAT

Meigs County, Olive Township: B. H. Putnam et al 1 M. A. Hall, Sec. 10, Berea 2,017-21 ft., 202,000 cu. ft. of gas. TD 2,029 ft.

EASTERN KENTUCKY

ASHLAND.—In Lee County, 19-N-69, Jack Kindred is drilling at 1,500 ft. on 1 C. J. Sipple, about 7 miles northwest of Beatyville, the county seat. Test will explore the upper part of the Knox dolomite and will be the first deep hole for that county in some years.

At present only one well is drilling in the newly discovered Furnace gas field of northern Estill County and southern Powell County. Petroleum Exploration Co. is drilling below 100 ft. on 1 Walter Shouse, located in 21-P-68, Powell County. The St. Peter sand is expected at about 2,300 ft. in this area.

In the western portion of Powell County, A. H. Carpenter is drilling 2,525 ft. on 1 James Hall, a seismic prospect. No information is being released on this test but it is understood that operators are drilling in the Knox dolomite.

SOUTH-CENTRAL KENTUCKY WILDCAT FAILURE

Clinton County: Bradley et al 1 Brown, 3-B-54, dry, TD 2,106 ft., Knox 1,750 ft., water.

WESTERN KENTUCKY

OWENSBORO.—J. C. Miller and Ashland Oil & Refining Co. 1 J. D. Bennett, NW SW SW 6-N-27, McLean County, is still testing the Cypress at 1,970-82 ft. The well was given a 60-qt. shot and pumped at the rate of 10 bbl. per hour.

A. D. Falletti and B. Turner are starting Cypress tests at 1 George Randolph, 17-P-20, about 1 mile east of Uniontown pool in Union County. The well had a recovery of 210 ft. of oil, 410 ft. of oil-cut mud, and 900 ft. of salt water on a drill-stem test of the Cypress at 2,325-36 ft.

WESTERN KENTUCKY WILDCAT FAILURE

Hopkins County: F. H. Rhodes 1 J. G. Soloman et al, SE NE NE 18-I-23, dry, TD 2,240 ft.

INDIANA

EVANSVILLE.—Dubois County has a shallow pool, indicated by production at H. C. Detrick 1 L. G. Mehne, NE SW NW 16-3s-5w. Operator is drilling below 650 ft. after finding gas, estimated at 100,000 cu. ft., at 280-87 ft. and a fillup of 20 ft. of oil at 520-26 ft. The oil pay was reported locally to be Tar Springs. The well is about 3 miles south of Huntingburg and about 12 miles northeast of Spurgeon pool. Aside from production in the small Kellerville pool, most of the old areas of the county have been abandoned.

Interest again turns to the area southwest of Evansville, where A. B. Potter has set casing for a test of the Waltersburg sand at 1 Robert Mahrenholz, SE SW NW 16-7s-11w, Vanderburgh County. A 1-hour drill-stem test at 1,628-51 ft. recovered 50 ft. of oil and 70 ft. of oil-cut mud with no water. Bottom-hole pressure was 650 psi. The well is about 1 mile southwest of Cypress pool and about 1 mile northwest of a recent well, S. D. Jarvis 1 D. Kolb, SE SW NW 22-7s-11w, that had a good show of oil in the McClosky.

George C. Schoonmaker has a good oil show in a north extension of College pool in Posey County. The well, 1 Bishop Grimmelsman, SE SE SE 9-8s-14w, had a recovery of 50 ft. of gas, 95 ft. of oil, and 25 ft. of oil-cut mud on a 2-hour drill-stem test of the Palestine at 1,730-40 ft.

A. S. Reed has indications of Devonian production in an old shallow gas area of Sullivan County. Operators has set casing at 2,228 ft. at 1 G. L. Bolinger, NE NE NE 19-9n-9w, and will test the Devonian. The gas pay in the area is from a shallow Pennsylvania sand.

INDIANA WILDCAT FAILURES

Gibson County: J. B. Buchman and O'Neal 1 Hart, SW SE NW 31-2s-10w, dry, TD 2,262 ft.

A. J. Slagter 1 Carl Simon, NW SE SE 17-4s-11w, dry, TD 2,533 ft.

Pike County: Graham Development Co. 1 Gladish, NE NW NE 36-1n-9w, dry, TD 1,549 ft.

Posey County: C. E. Skiles et al 1 Amick, NW NW SW 1-4s-13w, dry, TD 2,992 ft.

Sullivan County: F. B. Cline et al 1 Fletcher, NE NE SW 24-9n-9w, dry, TD 1,475 ft.

R. C. Smith 1 W. L. Hollsbough, SW SW NE 16-9n-8w, dry, TD 2,139 ft.

M. Shuck and Aurora Gasoline Co. 1 A. T. Osburne, NE SW SW 7-8n-9w, dry, TD 2,489 ft.

LA.-ARK.

Tokio Sand Adds New Pay in Bellevue Field

SHREVEPORT. — Tokio sand production was added as a new pay in the southeast section of Bellevue field of Bossier Parish, at Sam Siegel, Jr., 2 Lodiwick Lumber Co., 26-19n-11w. The well flowed 48½ bbl. of 37°-gravity oil in 4 hours, through 15/64-in. choke. It was drilled to 2,000 ft., casing set at 1,699 ft. and perforated from 1,629-36 ft. Flowing tubing pressure was 330 psi. Nearby producers are said to be very shallow, with total depths ranging around 400 ft.

New work reported during the week included Hunt Oil Co.'s second test for the East Haynesville Smackover field, which will be the 1 John R. Smith, 10-23n-7w. Location is 1,987 ft. south and 1,980 ft. east of the northwest corner of the section. Contract depth is 11,000 ft. The new drill site is approximately 2 miles north and slightly east of the same company's 1 A. O. Goodwin, in 21-23n-7w, which extended deep production some 3 miles from Haynesville field.

In Arkansas, a prospective completion in the Hogg sand will extend production at the south end of Wesson field of Ouachita County. Sohio Petroleum Co. 5 J. D. McClurkin, NW SE NE 33-15s-19w, drilled sand with good saturation from 3,130-50 ft., then another 50 ft. of broken sand and shale. Casing was set to 3,200 ft. and tubing run for completion tests.

Raney Exploration Co. was moving in to drill its 1 J. C. Milner, in SW NW NE 24-15s-20w, Columbia County. The new wildcat is located about 1 mile southwest of the same company's 1 H. D. Brown estate in Smart field of Ouachita County. The new location is about the center of an old shallow producing area 2 miles west of Stephens. Location is said to be on a farmout from Ohio Oil Co.

ARKANSAS WILDCAT FAILURES

Cross County: Ramsey Petroleum Co. 1 Poinsett Lbr., SE NE SW 35-9n-4e, dry, TD 3,508 ft., Nacatoch 2,240 ft. by samples.

LaFayette County: Stanolind 1 Bodcaw, NE SW 29-19s-23w, dry, TD 11,434 ft., Buckner 10,866 ft., Smackover 10,990 ft., elev. 237 ft.

NORTH LOUISIANA WILDCAT FAILURE

Union Parish: Carbons Consolidated 1 Frost Lbr., SE SE SE 13-23n-2e, dry, TD 3,817 ft.

Engineers Are Eligible For Army Appointments

Petroleum and natural-gas engineers who meet the requirements of age, education, experience, and physical condition are now eligible for reserve commissions in the Army of the United States, ranging from second lieutenant up to and including full colonel, depending upon qualifications and experience of the individual.

Applicants must be at least 21 and not over 55 years of age for appointment in the Reserve Corps, and must be citizens of the United States. No previous military experience is required. A bachelor's degree in petroleum and natural-gas engineering, fuel technology, or related fields qualifies for appointment.

For appointment in grades of first lieutenant through colonel, applicants, in addition to degrees specified, must have had additional qualifying education or progressive professional engineering experience in exploration and study of new oil fields, development of wells, production, transportation, or refining.

Full particulars of this program are explained in Army Circular No. 210 which is available by writing The Adjutant General, Department of the Army, Washington 25, D. C.

Ten Month's Completions Gain 18.5 Per Cent Over Last Year

by Polly De Armond

COMPARISONS of cumulative figures for 10 months of 1948 and 1947 reflect gains this year in both wells and footage drilled. The total number of completions for the current period increased 5,081, or 18.5 per cent, over the same period last year. Of these wells 64 per cent were oil or gas producers—the same ratio of successful completions for the 1947 period. Footage reached 112,093,022 ft., a gain of 17,610,211 ft., or 18.3 per cent.

Major Increases

Percentagewise, the Rocky Mountain region recorded the greatest increases for January through October, with a gain of 287 wells, or 45 per cent, in completions and a gain of more than 1,409,000 ft., or 59.3 per cent, in footage. The Pacific Coast was up 688 wells, or 39.9 per cent, and over 1,381,000 ft. for an 18.5 per cent increase in depth drilled.

Texas and New Mexico completion figures represent an increase of 27.7 per cent over last year, while footage climbed 25.4 per cent for that area.

The southern states of Louisiana, Arkansas, Mississippi, Alabama, Georgia and Florida reported an increase of 27.5 per cent in total wells, but only 8.4 per cent increase in footage drilled.

Other Comparisons

The North Central section, including Ohio, Indiana, Kentucky, Illinois and Michigan, noted 917 more wells for 1948, or 19.8 per cent, and 12,734,222 ft., a gain of 15.7 per cent over 1947. The Mid-Continent division (Oklahoma, Kansas, Nebraska and Missouri) was up 13 per cent in completions and 21.3 per cent in footage.

The Eastern district, comprised of New York, Pennsylvania and West Virginia, reflected the only decreases for the period. Completions were down 7.2 per cent and footage declined 9.7 per cent.

Rigs and Drilling Record

As of November 1, for the first time the rigs and drilling figure exceeded 5,000. The new record number of 5,105 active rigs would seem to indicate that operators still hope to accomplish their forecast all-time completion record for this year.

October vs. October

The preliminary summary for October 1948 shows an increase of 437 wells, or 13.4 per cent, over the same month of the previous year, and an increase of 1,936,209 ft., or 18.2 per cent in footage.

The Rocky Mountain region was up 89.3 per cent in wells and 113 per cent in footage. The North Central section had a 37.3 per cent gain in wells and a 38.8 per cent gain in footage. Wells in Texas and New Mexico rose 29.1 per cent and footage rose 35.8 per cent.

The Pacific Coast reported a 26.2 per cent completions gain and a 30.2 footage gain; the Mid-Continent area increased slightly in both categories. The Eastern district dropped 21.3 per cent in wells and 37.5 per cent in footage, and the southern states recorded negligible losses in completions and depth drilled.

SUMMARY OF COMPLETIONS, OCTOBER 1948

	Total comp.	Oil	Initial prod.	Gas	Dry	Under 2,500 ft.	2,500-5,000 ft.	5,000-7,500 ft.	7,500-10,000 ft.	Over 10,000 ft.	Total footage	Rigs and drilling
New York	111	56	118	0	55	111	0	0	0	0	160,051	148
Pennsylvania	300	157	346	21	122	284	16	0	0	0	465,739	269
West Virginia	75	19	256	44	12	43	27	5	0	0	18,275	169
Ohio	154	48	1,033	38	68	75	74	5	0	0	387,330	180
Indiana	110	47	3,803	1	62	83	27	0	0	0	213,776	119
Kentucky	109	39	2,549	26	44	89	20	0	0	0	197,894	52
Illinois	302	149	16,264	0	153	106	196	0	0	0	774,461	299
Michigan	105	44	6,712	4	57	73	31	1	0	0	226,265	136
Kansas	311	147	96,171	37	127	47	260	4	0	0	1,031,355	417
Neb., Mo., Iowa	2	1	25	0	1	1	1	0	0	0	4,363	10
Oklahoma	417	221	35,926	40	156	130	190	79	11	7	1,515,703	689
Texas	971	611	110,016	38	322	221	425	190	107	28	4,516,383	1,346
North	180	89	8,983	0	91	92	64	23	1	0	509,531	201
West Central	118	55	8,660	3	60	28	81	9	0	0	388,045	137
West	255	223	67,859	4	28	40	119	41	43	12	1,320,029	248
Panhandle	54	41	3,735	11	2	0	54	0	0	0	163,706	178
Eastern	61	33	5,412	4	24	3	32	12	13	1	330,897	121
Gulf Coast	144	84	9,654	12	48	6	37	49	38	14	939,569	263
Southwest	159	86	5,713	4	69	52	38	56	12	1	864,606	198
Louisiana	201	134	11,017	13	54	109	24	13	34	21	881,906	277
Northern	143	101	5,973	12	30	108	15	6	11	3	393,870	81
Southern	58	33	5,044	1	24	1	9	7	23	18	488,036	196
Arkansas	29	14	1,754	1	14	5	16	4	4	0	129,349	43
Mississippi	33	16	2,383	1	16	1	3	15	9	5	232,854	55
Ala., Ga., Fla.	4	0	0	0	4	0	1	2	0	1	28,008	12
Montana	38	21	1,374	3	14	29	8	1	0	0	85,813	100
Wyoming	80	55	10,765	2	23	8	46	19	5	2	352,362	236
Colorado-Utah	24	13	1,828	2	9	2	6	15	1	0	130,793	74
New Mexico	48	33	6,428	3	12	7	28	11	2	0	194,793	133
California	§270	202	38,965	1	§67	104	123	§17	12	14	1,049,490	341
Total October 1948	3,694	†2,027	347,733	275	*1,392	1,528	1,522	381	185	78	12,596,963	‡5,105
Total September 1948	3,777	2,153	310,417	276	1,348	1,494	1,545	440	215	83	13,077,396	4,935
Total October 1947	3,257	1,762	302,355	341	1,154	1,437	1,293	464		63	10,660,754	4,718
Cum. 10 months 1948	32,561	18,531	2,769,519	2,357	11,673	12,949	13,335	3,740	1,763	774	112,093,022	
Cum. 10 months 1947	27,480	15,016	2,674,587	2,760	9,704	11,786	10,468	4,566		660	94,482,811	

*Incl. 212 service wells: N. Y. 55, Pa. 120, Ohio 13, Mich. 11, Kans. 2, Okla. 8, No. Tex. 2, E. Tex. 1. †Incl. 23 distillate wells: Okla. 1, W. Tex. 2, E. Tex. 1, Tex. Gulf 6, S. W. Tex. 1, No. La. 5, So. La. 4, Ark. 1, Miss. 2. ‡Incl. all wells rigged up and/or drilling at end of month. §Incl. Wash. 1.

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Texas Gas Shutdown Attacked in Courts

(Continued from page 37)

(Compressor facilities costing $685,000 are being installed to deliver gas to the Houston Natural Gas Co. next May.)

Tijerina - Canales - Blucher, Lower Gulf Coast: As of October 26 there were 179 producing oil wells with 24 of them having gas-oil ratios in excess of 2,000. Large quantities of wet casing-head gas are being flared.

(A $2,000,000 injection plant now under construction is scheduled to be completed by February 15.)

Foster, West Texas: As of November 15 there were approximately 650 producing wells. Cities Service Oil Co. and Odessa Natural Gasoline Co. operate plants in the field and approximately 600 of the 650 wells are tied into these plants. Approximately 5,000 M.c.f. of gas daily is vented either as unprocessed gas or as residue from the plants.

(Plants are now processing 73½ per cent of all gas produced, and steps will be taken over the next few months to eliminate all flares.)

Fullerton, West Texas: As of October 26 there were 649 producing oil wells and 288 of them have gas-oil ratios in excess of 2,000. Phillips Petroleum Co. operates a gas processing plant to which 520 of the 649 wells are connected. From the 129 unconnected wells, approximately 8,000 M.c.f. of gas daily is being vented, and 27.82 per cent of the plant residue gas is also being vented. This averaged 21,491 M.c.f. daily during October.

(In the southern part of the field, a group of operators have agreed to build a second plant with an ultimate capacity of 55,000 M.c.f. daily. Phillips Petroleum Co. and Fullerton Oil Co. have made an offer of a 6-year contract to take the gas, planned for the plant, and this is now under consideration. This second plant has an estimated completion date of March 1, 1950.)

Goldsmith, West Texas: As of October 26 there were 1,113 producing oil wells and 639 had gas-oil ratios over 2,000. Phillips Petroleum Co. operates a gas-processing plant with 1,085 of the wells tied in. Of the plant residue gas, 56.96 per cent was being vented as of October 26. This averaged 59,731 M.c.f. daily during October. From the wells not connected and the plant 64,000 M.c.f. of gas daily was flared during October.

(By 1949, plans call for the utilization of all available gas where economically feasible. Additional facilities are now under construction to increase the capacity of Phillips' plant. This plant has more than doubled its throughput since April 1947.)

Levelland, West Texas: As of October 26 there were 879 producing oil wells and 19 of them had gas-oil ratios exceeding 2,000. Approximately 13,000 M.c.f. of gas daily was flared during September and October.

(There is no plant at present, but active plans are under way to build one with a capacity of 40,000 M.c.f. daily.)

McElroy, West Texas: As of November 15 there were 802 producing oil wells. Phillips Petroleum Co. operates a plant to which 578 of the wells are connected. Plant residue is being vented and averaged 14,000 M.c.f. during October.

(El Paso Natural Gas Co. plans to take 15,000 M.c.f. daily from the field. A Gulf Oil Co. representative reported on an experimental gas-injection project but said the corrosive nature of the gas probably would make this impractical.)

Seminole, West Texas: As of November 15 there were 330 producing oil wells. Phillips Petroleum Co. operates a plant to which 321 of the 330 wells are connected. A portion of the plant residue is being vented and during October this averaged 9,000 M.c.f. daily. A trade made by El Paso Natural Gas Co. with Columbia Carbon Co. has been worked out whereby the flare gas may be utilized.

(Compressors in the field are now overloaded, but plans are under way to install more.)

Slaughter, West Texas: As of October 26 there were 2,115 producing oil wells and 61 of these had gas-oil ratios exceeding 2,000. Daily average casing-head gas produced is in excess of 45,000 M.c.f.

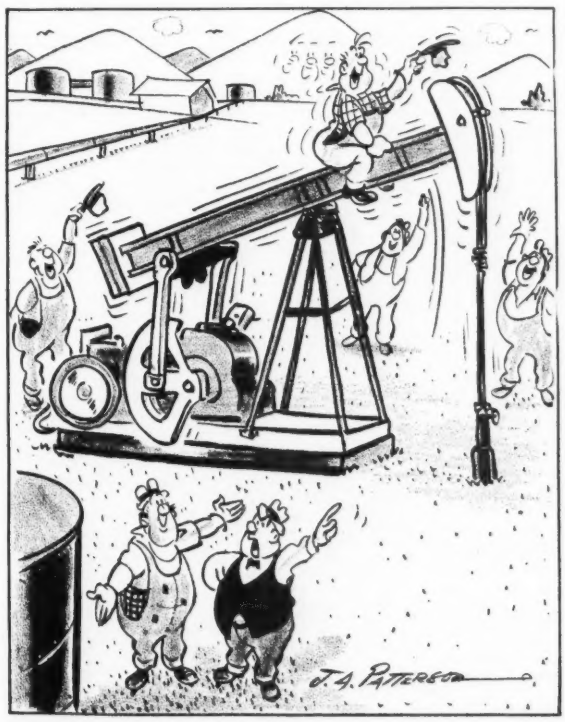
(A processing plant with a design capacity of 90,000 M.c.f. daily is 55 per cent completed and should be in operation by February 1949 with El Paso Natural Gas Co. to take substantially all residue.)

Wasson, West Texas: As of November 15 there were 1,582 producing oil wells. Shell Oil Co. operates two plants with 1,430 of the 1,582 wells connected. As of October 26, 47,000 M.c.f. daily of residue gas was being vented.

(By next June, sufficient additional plant capacity will be completed to handle all gas in the field.)

Conroe, Upper Gulf Coast: As of November 15 there were 873 oil wells and 83 had excessive gas-oil ratios. Two plants are in its field with one operated by Humble and the other by Midland Gasoline Co. Tied into the plants are 792 of the field's 873 wells. A portion of the plants' residue gas is being vented, and during October averaged 15,460 M.c.f. daily.

(Gas-lift compressors will be installed by April 1949 and another gasoline plant will be completed in August 1949. Midland has reached a contract with United to take up to 30,000 M.c.f. daily from its plant, and equipment should be in operation in about a year to handle this gas.)



THE OIL AND GAS JOURNAL

"Rodeo champ or not—tell him to get back to work and practice on his own time!"

STATISTICS and TR

WEEKLY WELL COMPLETIONS . . . WEEK ENDED NOVEMBER 27, 1948

	Total of all wells							Wildcat completions and discoveries									
						Cum.							Cumulative total, 1948				
	Comp.	Oil	Gas	Dry	Footage	1948	1947	Oil	Dist.	Gas	Dry	Total	Oil	Dist.	Gas	Dry	Total
New York	22	11	0	*11	21,903	1,362	1,583	0	0	0	0	0	0	0	0	0	0
Pennsylvania	43	18	6	†19	73,601	2,328	2,852	0	0	0	0	0	0	0	9	14	23
West Virginia	14	4	9	1	39,191	754	796	0	0	0	0	0	3	0	37	43	83
Ohio	29	10	6	‡13	47,251	1,272	1,246	0	0	1	0	1	2	0	11	34	47
Indiana	24	9	0	15	51,418	1,008	598	0	0	0	7	7	27	0	1	86	114
Kentucky	15	7	0	8	23,684	727	681	0	0	0	2	2	9	0	0	39	48
Illinois	61	31	1	29	157,184	2,271	1,909	1	0	1	9	11	47	0	2	347	396
Michigan	15	6	0	9	30,322	802	841	1	0	0	5	6	18	0	10	245	273
Kansas	76	45	4	§27	246,344	2,878	2,473	3	0	0	11	14	59	0	7	409	475
Neb., Mo., Iowa	0	0	0	0	0	9	5	0	0	0	0	0	0	0	0	7	7
Oklahoma	93	55	4	¶34	321,038	3,834	3,698	2	0	0	13	15	119	8	27	583	737
Texas	232	144	11	77	1,026,793	10,935	8,419	4	1	5	32	42	307	32	95	1,872	2,306
North Central (Dist. 7-B & 9)	77	41	0	36	218,310	3,411	2,642	2	1	0	10	13	111	2	13	685	811
West (Dist. 7-C & 8)	58	49	1	8	295,785	2,931	2,065	1	0	1	5	7	63	1	6	211	281
Panhandle (Dist. 10)	6	3	3	0	17,899	593	427	0	0	0	0	0	1	0	3	11	15
Eastern (Dist. 5 & 6)	9	3	1	5	47,513	538	520	0	0	0	2	2	12	2	0	109	123
Gulf Coast (Dist. 2 & 3)	39	24	2	13	250,920	1,722	1,432	0	0	2	9	11	71	22	34	398	525
Southwest (Dist. 1 & 4)	43	24	4	15	196,366	1,740	1,333	1	0	2	6	9	49	5	39	458	551
Louisiana	31	18	4	9	180,735	2,114	1,470	2	0	0	2	4	45	25	8	196	274
Northern	18	8	4	6	57,973	1,421	868	0	0	0	1	1	4	4	2	99	109
Southern	13	10	0	3	122,762	693	602	2	0	0	1	3	41	21	6	97	165
Arkansas	5	2	0	3	24,018	279	303	0	0	0	2	2	6	0	0	84	90
Mississippi	7	4	0	3	57,737	377	441	0	0	0	3	3	4	1	3	89	97
Southeastern States	0	0	0	0	0	51	59	0	0	0	0	0	0	0	0	47	47
Montana	14	9	3	2	26,749	281	280	0	0	0	1	1	4	0	0	22	26
Wyoming	22	14	0	8	99,645	540	234	0	0	0	4	4	25	0	2	69	96
Colorado-Utah	1	1	0	0	6,444	209	189	0	0	0	0	0	3	0	5	45	53
New Mexico	8	5	0	3	23,995	544	485	0	0	0	0	0	4	1	3	51	59
California	55	46	0	9	192,261	2,610	1,838	2	0	0	7	9	114	1	5	314	434
Total United States	767	439	48	280	2,650,313	35,185	30,400	15	1	7	98	121	796	68	225	4,596	5,685
Total previous week	774	446	42	286	2,834,968	34,418	29,736	22	4	2	112	140	781	67	218	4,498	5,564
Total November 29, 1947	664	358	59	247	2,337,503			9	0	2	89	100	641	86	204	3,744	4,675

Service wells included: *11, †18, ‡3, §2, ¶1.

CRUDE PRICES AND REFINERY ACTIVITY

GRAVITY SCHEDULES

Gravity—	Signal Hill, Calif.	Okla-homa, Kansas	Gulf Coast Tex.*	West Tex.†
18-18.9	$2.17	....	....	....
19-19.9	2.19	....	....	....
20-20.9	2.21	$2.25	....	$2.12
21-21.9	2.23	2.27	....	2.14
22-22.9	2.27	2.29	....	2.16
23-23.9	2.30	2.31	....	2.18
24-24.9	2.34	2.33	$2.56	2.20
25-25.9	2.38	2.35	2.58	2.22
26-26.9	2.41	2.37	2.60	2.24
27-27.9	2.45	2.39	2.62	2.26
28-28.9	2.49	2.41	2.64	2.28
29-29.9	2.52	2.43	2.66	2.30
30-30.9	2.56	2.45	2.68	2.32
31-31.9	2.59	2.47	2.70	2.34
32-32.9	2.62	2.49	2.72	2.36
33-33.9	....	2.51	2.74	2.38
34-34.9	....	2.53	2.76	2.40
35-35.9	....	2.55	2.78	2.42
36-36.9	....	2.57	2.80	2.44
37-37.9	....	2.59	2.82	2.46
38-38.9	....	2.61	2.84	2.48
39-39.9	....	2.63	2.86	2.50
40 and above	....	2.65	2.88	2.52

*For crude from Daboval, El Campo, and Sand Point. †Includes Lea County, New Mexico. Last general price change represented a 50-cent increase becoming effective December 6, 1947. (For detailed price changes in all fields see The Oil and Gas Journal, January 1, 1948, page 107.) Effective September 28, 1948, Phillips Petroleum Co. advanced prices 35 cents per barrel over those shown in above table in fields of southwestern states where it buys. Advance has not been generally met by other buyers.

A.P.I. REFINERY REPORT, WEEK ENDED NOVEMBER 20

(Thousands of barrels)

District—	Crude runs, daily avg.	Production: Gasoline†	Kerosine	Gas & dist. oil	Residual	Stocks at refineries, bulk terminals, in transit and in pipe lines: Gasoline*	Kerosine	Gas & dist. oil	Residual
East Coast	851	2,097	271	1,177	1,543	21,832	11,150	26,041	12,374
Appalachian:									
District 1	95	290	60	83	72	2,319	436	1,014	437
District 2	77	281	23	85	119	1,145	122	274	225
Ind., Ill., Ky.	938	3,365	500	954	1,089	18,953	4,818	12,820	6,210
Okla., Kans., Mo.	436	1,636	191	506	489	8,220	1,648	6,255	2,981
Inland Texas	234	1,113	113	170	390	3,331	766	1,172	1,254
Texas Gulf Coast	1,403	4,456	721	2,178	1,889	15,277	3,924	15,252	11,145
La. Gulf Coast	442	1,339	371	777	521	5,156	2,264	4,111	3,774
N. La. and Ark.	88	230	60	86	130	1,982	565	876	335
Rocky Mountain:									
New Mexico	14	51	7	12	27	69	25	54	33
Other Rocky Mtn.	143	464	23	218	257	1,828	286	1,677	1,088
California	955	2,480	132	1,331	2,593	11,132	904	14,846	44,721
November 20, 1948	5,676	17,802	2,472	7,577	9,119	91,244	26,908	84,392	84,577
November 13, 1948	5,712	17,811	2,665	7,669	8,964	91,795	26,528	83,979	83,659
November 22, 1947	5,229	16,138	2,192	6,574	8,447	84,777	21,218	62,646	56,774

*Finished and unfinished. †At refineries including natural blended.

Bureau of Mines crude-oil stocks 233,982,000 bbl. as of November 13 —up 733,000 bbl. One year ago 222,901,000 bbl.

FLAT CRUDE PRICES

Representative posted schedules per bbl.			
East Texas	$2.65	Pecos County, Texas (Yates)	2.35
Kettleman Hills, California*	2.14	Bradford, Pennsylvania	5.00
Beauregard Parish	2.60	Eastern Ill. and Western Ind.†	2.77
Illinois Basin	2.77	Tomball, Texas Gulf Coast	2.83

*37°-37.9°. †35° and above.

TRENDS

DAILY AVERAGE PRODUCTION FOR WEEK

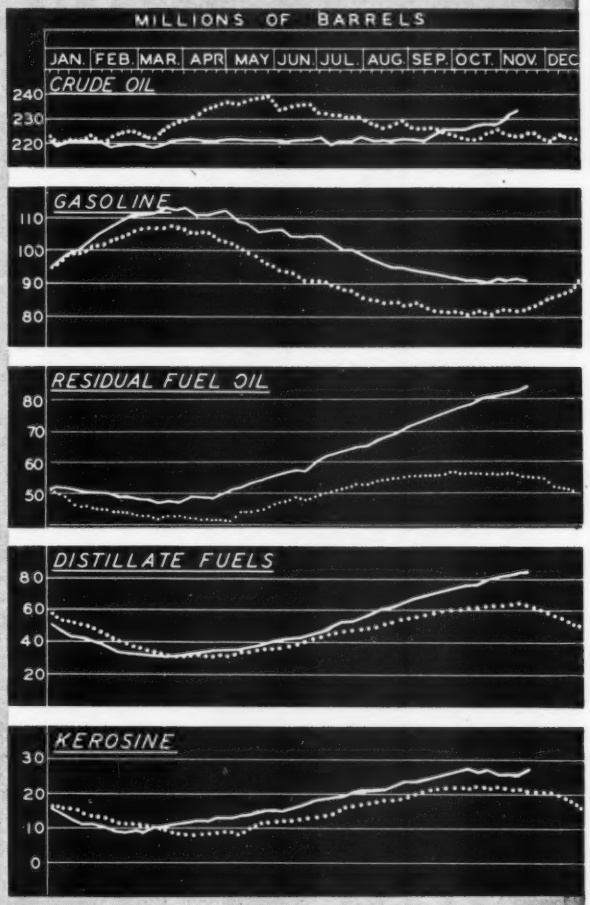
	Nov. 27 crude oil	B. of M. Nov. demand	Nov. 20 crude oil
Alabama	1,300	1,500	1,350
Arkansas	81,050	88,000	81,500
California	959,750	960,000	960,100
Colorado	49,430	48,000	48,970
Eastern	62,950	65,300	63,100
Florida	775	1,000	700
Illinois	179,600	167,000	179,500
Indiana	26,200	17,500	26,000
Kansas	283,400	306,000	307,600
Kentucky	24,400	23,000	24,100
Louisiana	492,450	500,000	493,250
North Louisiana	113,800	.....	114,600
South Louisiana	378,650	.....	378,650
Michigan	48,300	45,000	45,200
Mississippi	130,200	131,000	127,550
Montana	24,280	26,000	28,920
Nebraska	350	700	350
New Mexico	134,605	134,000	134,605
Oklahoma	442,400	436,000	440,900
Texas	2,523,850	2,460,000	2,523,850
Dist. 1 (Southwest)	27,640	.....	27,640
Dist. 2 (Southwest)	177,900	.....	177,900
Dist. 4 (Southwest)	255,050	.....	255,050
Dist. 3 (Gulf Coast)	504,310	.....	504,310
Dist. 5 (Eastern)	51,775	.....	51,775
Dist. 6 (Eastern)	124,875	.....	124,875
East Texas Field	297,500	.....	297,500
Dist. 7-C (West)	48,825	.....	48,825
Dist. 8 (West)	746,825	.....	746,825
Dist. 7-B (W. Central)	57,925	.....	57,925
Dist. 9 (N. Central)	142,525	.....	142,525
Dist. 10 (Panhandle)	88,700	.....	88,700
Wyoming	155,490	150,000	169,090
Total United States	*5,620,780	5,560,000	5,656,635
Change from prev. wk., dn.	35,855		

Total production January 1-November 27 †1,803,185,850 bbl.
Same period last year (crude plus cond.) 1,676,012,955 bbl.

*Not incl. 77,155 bbl. condensate. †Incl. 24,735,600 bbl. condensate.

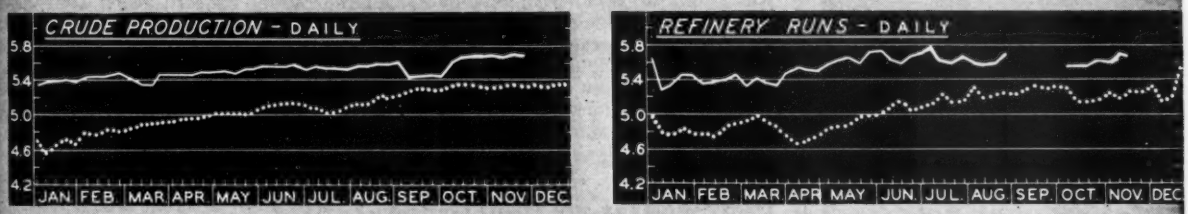
STOCKS IN UNITED STATES

---- 1947 ——— 1948



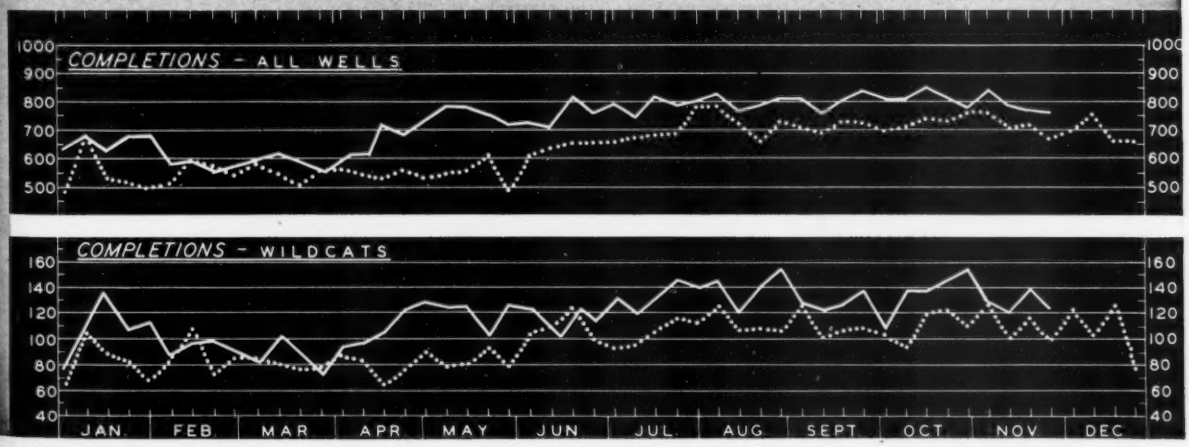
DAILY OPERATIONS

---- 1947 ——— 1948

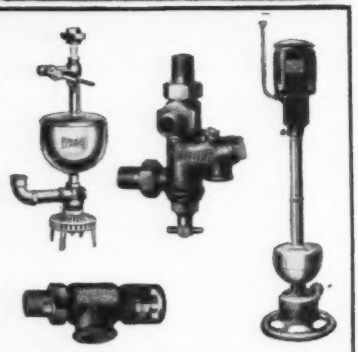


WEEKLY COMPLETIONS

---- 1947 ——— 1948



PENBERTHY
QUALITY
PRODUCTS



Penberthy injectors—ejectors—automatic electric and water (or steam) operated sump pumps are all widely used throughout the oil industry because they have always been dependable under the most severe service conditions.
All are of rugged construction and made by an organization with 59 years experience in the manufacture of highest quality products.

PENBERTHY INJECTOR CO.
DETROIT 2, MICH. Canadian Plant WINDSOR, ONTARIO

Riddle Buys & Sells
PIPE

FOR SALE
Used Lapweld
Range 1
Casing and Tubing
Delivered in Carload
Lots Only,
Texas and Oklahoma
2" Tubing, $0.48 per ft.
5½" Tubing, $2.30 per ft.
7" Tubing, $2.35 per ft.
8⅝" Tubing, $3.65 per ft.

WRITE, WIRE OR PHONE
RIDDLE OIL CO.
59 EAST VAN BUREN ST.
CHICAGO, ILL.
OR
SEGUIN, TEXAS

MARKETS

THE reaction of observers in marketing circles last week generally expressed some degree of puzzlement over the possible general crude-price increase. Present conditions now facing the industry do not call for a general price increase at this time, marketing men pointed out. In view of a weakening market for some petroleum products, evident over the past few months, and considering the record high production levels of crude oil and the exceptionally high stock levels of certain products which in some cases have caused refineries to cut down on their runs, the advisability of a crude-price increase was questioned.

Even if the crude advance becomes general little hope was seen in a substantial strengthening of price levels for those weak products such as heavy residual oil which recently was cut 20 cents per barrel in barge and tank cars at all points along the Atlantic Seaboard and 21 cents at the Gulf. The reduction also affected Bunker C fuel oil prices to ships, but not marine diesel fuel. Those products most likely to be affected by the crude-price increase, should it become general, would be gasoline, kerosine, and light burning oils, which will be in heavier demand this winter.

Atlantic Seaboard

On the East Coast, several other major products suppliers met Esso Standard Oil Co.'s generally downward adjustments of the previous week. The price pattern, however, was not uniform with companies meeting only part of Esso's changes and in certain areas. No major company had met the No. 2 changes in New York and New England.

The strike of dock workers in New York and the immobilizing of considerable shipping further cut into the demand for heavy fuel oil. These vessels require large amounts of this fuel, and with the ships inactive, storage in New York was reported completely full.

Esso Standard's action in cutting prices of heavy fuel oil 20 cents in the East and 21 cents at the Gulf reflected weakness of several months in this material. But the company's adjustments of No. 2 and gasoline prices providing larger margins for distributors apparently caught New York marketing circles by surprise.

Mid-Continent Area

In the Mid-Continent area spot-market trading of petroleum products continued slow. The colder weather experienced by many areas had not yet affected the market appreciably. One reason for this, it was pointed out, was the ample stock levels of distributors and consumers in home and industrial heating oils.

One Mid-Continent refiner reported that he found it necessary to turn back crude which he was unable to use. He pointed out that the high production of crude and high stock levels of crude and products in a relatively soft market makes a price increase in crude hardly advisable at this time.

Gulf Coast

In the Gulf Coast area spot-market trading of petroleum products was reported as "terribly slow," by one supplier. One report disclosed that housebrand gasoline was being offered by one concern at 9¾ cents per gallon or ¾ cent below the published low. No noticeable effect on the market has been evident in Gulf Coast trading since the backing of Phillip's stand by Sinclair-Prairie. Kerosine continued to be held closely with few offerings reported.

Representative Quotations

Representative spot-market quotations of leading suppliers as of November 29, 1948. Figures are f.o.b. plant for tank-car shipment in cents per gallon, except for residual fuel oil which shows the price per barrel and wax, in cents per pound.

GASOLINE, KEROSINE, AND FUEL OILS

	Mid-Continent Group 3	New York Harbor	Texas Gulf Coast
Regular gasoline, 73-75 octane	10¼-10½	11.6-12* 10.5-11.9†	10¼-11½
Premium gasoline, 78-80 octane	11-11¼	10.6-13.4	11-12¼
42-44 w.w. kerosine	9⅜-9¾	10.3-11.7	9½-10¼
No. 2 straw fuel oil	8⅞-9¼	9.1-10.1	9-9½
No. 6 residual	$1.70-2.00	$2.83-3.05	$2.20-2.52

*Branded (74-76 octane); †Unbranded (74-76 octane)

NATURAL GASOLINE

	Group 3	North Texas	N. La.
Grade 26-70	8½	8	8¼
Grade 18-55	10.2	9.6	9.9

LUBRICATING OILS

South Texas

200 vis., No. 2-3 neutral	12-13.5
750 vis., No. 3-4 neutral	15-16.5
2,000 No. 5-6 neutral	17-18.5

LUBRICATING OILS

Mid-Continent

150-160 vis., D bright stock, 0-10 pp.	31-33
200 vis. No. 3 neutral, 0-10 pp.	19-21

Western Pennsylvania

144-155 vis. 10 p.t. bright stock	40.5
180 vis. p.t. neutral	38.5

CRUDE-SCALE WAX

Mid-Continent

132-134 A.M.P.	5½

EQUIPMENT MEN ... in the News

Murphy Diesel Relocates Tulsa Branch Plant

Murphy Diesel Co., Milwaukee, has moved its Tulsa factory branch to 113 South Elwood where expanded service facilities are maintained. Floor space has been increased and stock-room facilities enlarged. As required, additional salesmen will be hired to serve the Mid-Continent area. W. J. (Bill) Epler, who joined the company in May of this year, is manager.

Dawson Elected President Jessop Steel International

Howard M. Dawson has been elected president of Jessop Steel International Corp., Post Building, New York, according to an announcement by the board of directors. He was formerly vice president and managing director of the corporation. Jessop Steel International Corp. is a wholly owned subsidiary of Jessop Steel Co., manufacturer of specialty steels with main offices and plant in Washington, Pa.

Walton of Ideco Making Latin American Survey

George W. (Jack) Walton, vice president in charge of machinery and export division of International Derrick & Equipment Co., has left Dallas headquarters for South America. He will call on Ideco offices and representatives in Caracas, Buenos Aires, and Rio de Janeiro. Field trips are contemplated in all important oil regions to observe Ideco equipment now in operation and to ascertain future South American equipment requirements.

Pew Appointed District Manager Hewitt-Robins

John W. Pew has been appointed district manager of the Houston office of Hewitt rubber division, Hewitt-Robins, Inc., according to an announcement made by J. H. Hayden, vice president in charge of sales. Pew joined the Hewitt organization in 1936 as a factory employe, later being transferred to the company's laboratary. He became a member of the sales staff in 1945 and was transferred to the Chicago office as a sales representative in 1946. Pew will be assisted in his new post by Don Burge, recently named a Hewitt sales representative. Burge has been associated in the oil-field-supply business for several years.

Thew Shovel Appoints Maynard Export Manager

R. T. MAYNARD

M. B. Garber, general sales manager, Thew Shovel Co., Lorain, Ohio, has announced the promotion of Robert T. Maynard to export manager. Prior to his appointment Maynard was district sales manager of the Mid-Atlantic territory with headquarters in Washington, D. C. From 1939 until early 1948 when he joined Thew, Maynard served as export manager for Osgood Co. and General Excavator Co. of Marion, Ohio.

Personnel Changes Made by Kobe, Inc.

Charles E. Edwards, East Texas district representative of Kobe, Inc., has been appointed manager of the Oklahoma district.

He replaces J. T. Lewis, who has been assigned to West Texas. Edwards has been with Kobe since 1939, when he joined the company at Oklahoma City. For the past 3 years he has had headquarters at Longview.

Ralph N. Nelson has been appointed senior district representative in Brookhaven, Miss. Donald B. Ross has been transferred from the Mid-Continent technical service section to the general technical service division at Huntington Park, Calif. He will assist in promotional work being done by the division. Maury Anderson has been appointed district representative for the Rocky Mountain district at Rangely, Colo. He has been with Kobe approximately a year.

Galvin Appointed Executive Vice President Motorola

R. W. GALVIN

Paul V. Galvin, president, Motorola, Inc., has announced the appointment of his son, Robert W. Galvin, to the post of executive vice president of the firm. Galvin, who is 26 years old, has been a director since 1945. He joined the company in 1943 as assistant in Motorola's engineering department, then went into production control and later worked in the distribution and merchandising end of the business. Prior to his recent appointment he was assistant to Elmer Wavering, vice president.

Cutler-Hammer Opens New Tulsa Office

Announcement is made by E. K. Anderson, Cutler-Hammer Dallas district sales manager, of the opening of a new branch sales office in the Mayo building, Tulsa. B. R. Stratton will manage the new office as a branch of the company's Dallas district sales office.

Bowser Inc. Elects Ehrman Vice President

F. S. EHRMAN

Fred S. Ehrman, general sales manager of Bowser, Inc., since 1944, has been elected to the newly created post of vice president and director of sales. The announcement was made by R. Hosken Damon, president, following a meeting of the board of directors. Ehrman has been associated with Bowser, Inc., since 1925, and has served successively in experimental engineering, sales engineering, and divisional sales work.

Manhattan Rubber Celebrates Anniversary

Manhattan Rubber Division of Raybestos-Manhattan, Inc., Passaic, N. J.,

recently completed its fifty-fifth year. Today Manhattan is one of the largest manufacturers of mechanical rubber goods, including conveyor and transmission belting, V-belts, hose, molded goods, packing, rubber-lined tanks, and brake lining. About 4,000 persons are now employed at the plant that covers more than a million square feet of floor space. Sumner Simpson is chairman of Raybestos-Manhattan, Inc., and John F. D. Rohrbach is president.

Waldrip Appoints Hampton San Joaquin Manager

Waldrip Engineering Co., Hollydale, Calif., has appointed Jack Hampton as manager of sales and service in the San Joaquin Valley district. Hampton has had previous service with Shell Oil Co., Inc., California Petroleum Co., Texas Co., Union Oil Co., Hofco Pump Co., and Fluid Packed Pump Co.

New Managers Appointed By Gar Wood Industries

N. A. Jorgensen has been appointed regional manager of the northeast region by Gar Wood Industries, Inc., and W. E. Toensing has been appointed district manager in Virginia, North Carolina, South Carolina, and the District of Columbia.

Both will be responsible in their regions for the sale and distribution of Gar Wood truck and tractor equipment, Buckeye ditchers, shovels, finegraders, and other equipment manufactured by the company. Prior to his appointment, Jorgensen was manager of the New York branch of Gar Wood and Toensing was service manager for the St. Paul division, Minneapolis.

Wm. Powell Appoints Comer at New York

JOE L. COMER

James Coombe, president of Wm. Powell Co., valve manufacturers of Cincinnati, announces the appointment of Joe L. Comer as vice president in charge of sales in the New York area, with offices at 50 Church Street, New York City. Comer was for many years engaged in general sales and trade relations with Crane Co. He has also served as vice president of Culbert Pipe & Fittings.

Koberg Promoted by Byron Jackson Company

E. R. KOBERG

D. M. MUNDINGER

E. R. "Ed" Koberg, Baton Rouge sales engineer for Byron Jackson Co., oil tool division, has recently been promoted to the company's Mid-Continent headquarters at Houston. Koberg, who has been located at Baton Rouge with Byron Jackson for the past 5 years, was replaced by D. M. Mundinger, who comes to the company from Stone & Webster.

Denver Offices Opened By Core Laboratories

Core Laboratories, Inc., has opened offices in the U. S. National Bank Building, Denver. James D. Harris, district engineer, will direct the company's drill-cuttings and core-analysis activities in the Rocky Mountain area. Permanent laboratory facilities have been established in Worland, Wyo., and a large part of Core Lab's new equipment now being constructed under a $250,000 expansion program has been designated to service Colorado, Wyoming, and Montana drilling operations.

Committee Seeks Additional Allocation of Steel

A. E. Cudlipp, vice president and sales manager of Lufkin Foundry & Machine Co., chairman of the committee acting for the Walking-Beam Type Pumping Units, Derricks, Substructures and Accessories Industry, has returned from Washington where conferences were held with the Petroleum, Gas and Oil Equipment Negotiation Division, Office of Industry in petitioning for additional allocation of steel for the manufacture of pumping units. H. H. Safford, secretary of the Petroleum Equipment Suppliers Association, worked with the committee in preparing the presentation.

Serving on the committee with Cudlipp are H. J. Woolslayer, Lee C. Moore Co., Tulsa; Carl G. Krepper, Muskogee Iron Works, Muskogee, Okla.; Roger Bramble, Lacy Oil Tool Co., Los Angeles; J. E. Lott, American Manufacturing Co. of Texas, Fort Worth; and W. V. Rathbone, Parkersburg Rig & Reel Co., Parkersburg, W. Va.

Johnston Makes Survey On Formation Testing

Tommy Johnston, general manager of M. O. Johnston Oil Field Service Corp., recently completed a tour of New Mexico, West Texas, Oklahoma, and Kansas. In the latter state he made a survey of formation testing and gun perforating preliminary to expanding Johnston's service facilities.

Foxboro Expands Training Program

An enlarged program of instruction, with emphasis on the selection an application of correct instrumentation for specific industries will be conducted by Foxboro Co. Courses begin January 10, and will include instrumentation in the refinery and chemical-process industries.

With this new and expanded program, Foxboro begins its fourteenth year of providing training facilities in industrial instrument engineering. The training courses, primarily intended for process engineers and instrument-maintenance men, are offered without charge to such men when sponsored by their respective companies.

OIC Institutes Tank Group For Steel Allocation Work

WASHINGTON.—The Office of Industry Cooperation last week set up an oil-terminal and bulk-tank-storage industry advisory committee to work with it on the proposed voluntary steel-allocation program under which some 16,000 tons of steel a month would be earmarked for terminal and bulk storage.

Membership of the committee was drawn from the fabricators of such equipment, and will include James M. Rumsey, Columbian Steel Tank Co., Kansas City, Mo.; Eugene Stroud, Modern Welding Co., Owensboro, Ky.; E. B. Biederman, General American Transportation Co., Chicago; A. C. Keyes, Keyes Tank & Supply Co., Casper, Wyo.; Tom Harle, Graver Tank & Manufacturing Co., East Chicago, Ind.; F. E. Scheffner, Lang Co., Inc., Salt Lake City; F. E. Isemann, Butler Manufacturing Co., Washing-

(Continued on page 165)

Classified Advertising

The Market Place for the Oil Industry

UNDISPLAYED

All ads, 12 cents a word. Minimum charge, $3.00 per insertion.
Centered Line, any ad, $1.00.
Box Numbers count 9 words when replies are to be sent to our Tulsa Office. Replies forwarded without charge.

DISPLAYED, PER INCH

$12.00 per column inch per insertion. One-point border and 12-point capitals are allowed. Larger type sizes not accepted.

All classified advertising payable in advance.
10% Discount if 3 insertions are ordered at one time.
COPY DEADLINE, 9:00 a.m. Monday prior to each week's issue.

THE OIL AND GAS JOURNAL
P. O. Box 1260, TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FRANKS double drum model 5000 spudder, excellent condition. Mast, lines, tools, dog house, light plant, butane tank. Complete and ready to go. Gleason Drilling Co., Russell, Kansas.

FOR SALE: Used Equipment in good condition: 2—6 cylinder Winton gasoline engines—7¼" bore, 8" stroke, 220 H.P. at 1050 RPM, direct connected, General Electric generator, 110 KW, 700 volts, Exciter generator 1½ KW, 64 volts, electric and air starter. 2—Traction motors on 653, G.E. type 240-E, 600 volt, 110 H.P. If interested make offer to J. H. Lauderdale, Missouri Pacific Lines, 1001 Missouri Pacific Bldg., St. Louis, Missouri.

FOR SALE

New oil well casing. Immediate delivery. 5½" diameter, 14 pound, J55 T and C seamless.

BOX C-696

THE OIL AND GAS JOURNAL
TULSA, OKLAHOMA

FOR SALE

IMMEDIATE DELIVERY

NEW PLAIN HOT ROLLED, ANNEALED MILD STEEL SHEETS
*Approx. 200 TONS—12 ga. x 36" x 96"

NEW HOT ROLLED MILD STEEL PLATES

* Approx. 50 TONS—⅛" x 5' x 12'.
* Approx. 260 TONS—⅜" x 5' x 15' & 20'
* Approx. 160 TONS—8 ga. x 5' x 20'

CARBON = .12 max.

FABRIKANT
STEEL PRODUCTS, Inc.

50th Floor—Woolworth Bldg.

NEW YORK 7, N. Y. BEekman 3-3041
CABLE ADDRESS: FABKANT, NEW YORK
MEMBER Association of Steel Distributors

EQUIPMENT FOR SALE

FOR CABLE TOOLS
DEGEN PIPE AND SUPPLY CO.
Box 107, Red Fork Station, Tulsa, Oklahoma

FOR SALE: New Steel Pipe—4" to 14". E. A. Tompkins Co., 2203 E. 28th St., Long Beach 6, Calif. Teleph. 4-5569.

FOR SALE: Oil Well Service Unit—Muskogee Model T Single Drum with Buda Model K428 Motor—Mounted on D-40 International Truck—45' Telescope A Mast Ready for Work. ¾" x 5000' Line, ⅞ x 800' Tubing Line, Few Tools, all for $3350.00. General Tool & Supply Co., P.O. Box 4387, Phone 6-1335, Oklahoma City, Okla.

FOR SALE: One 36-L Bucyrus-Erie Spudder, trailer mounted. Casing tackle equipment. Waukesha motor. Brand new. Latest model. Has never been used. Asking delivery price, no bonus. Telephone 166-J, Mt. Carmel, Illinois.

FOR SALE
USED COMPRESSORS

20—Ingersoll-Rand Belt Driven, Type 10 Compressor Units:
Two stage 5½ x 10½—12" stroke
Two stage 10 x 18—12" stroke
Single stage size range from 6 x 8 to 17 x 12

For inspection, correspond with or call:

SOUTH PENN NATURAL GAS COMPANY
Parkersburg, West Virginia

EQUIPMENT FOR SALE

PIPELINE Construction Equipment for Sale: Pipe cleaning machine with priming head, traveling or stationary, 6" to 12", excellent condition, $1,350. Two T40 International tractors with pipelayer attachments, good condition, very cheap. Contact C. W. Sternberg, 8250 Wier Drive, Houston, Texas. Phone Preston 7043.

FOR SALE: 7 Twin and 5 Single Clark Horiz. Engine Compressor Units in Oklahoma. Cities Service Oil Co., Patridge, Bartlesville, Oklahoma.

3000 ft. NEW 8⅝" OD, Naylor Spiral Weld Pipe 40' lengths, with Victrolic Couplings. A. A. Gilbert Pipe & Supply Co., Post Office Box 986, Shreveport, Louisiana.

MANUFACTURERS LATEST DESIGN

Hydraulic Casing Pulling Units. Complete line of equipment. Units made to your specifications. Truck Mountings or Skid Units. Repair Service and Parts.

OKLAHOMA MACHINE & SUPPLY CO.
Ada, Oklahoma

For Sale Emsco Mud Pump

Exposed liner type, Model C-12, Serial 213, size 7¼ x 12.

Mounted on skids equipped with suction and hose and 48" V-belt sheave.

Extra gaskets, valves, seats, heads, rods, and 1 set of 7¼ Emsco liner and 1 set of 6¾ Emsco liner.

Pump is in good condition and is up for your inspection in our yard at Great Bend, Kansas.

Crown Oil Company, Inc.

Great Bend, Kansas **Ph. 3571**

STEEL STORAGE TANKS

2—55,000 bbl., 114'6" x 30'0", Steel Roof
15—55,000 bbl., 114'6" x 30'0", Wood Roof.
2—18,000 bbl., 65' x 36', Steel Roof.
1—17,500 bbl., 60' x 35', Steel Roof.
1—10,000 bbl., 50' x 30', Steel Roof.
7—5,000 bbl., (Various Dimensions), Steel Roof.

Above tanks now standing various locations Texas, Oklahoma, Kansas, Illinois, and available for prompt delivery. Detailed specifications and prices available upon request.

HORWITZ PIPE & STEEL CO.

Ph. 2-9128 **Tulsa, Okla.**

"BIG INCH" Line Pipe
Delivery From Stock

24" O.D. x ⅜" Wall Electric Weld—
Made to A.P.I. Specifications 5L-X.

Also Prompt Delivery on Other Specifications of 24" O.D., As Well As 26" O.D. and 30" O.D.

LUCEY PRODUCTS CORPORATION
OIL WELL SUPPLIES
TULSA, OKLAHOMA

EQUIPMENT FOR SALE

FOR SALE: Wilson Super Model Winch powered by 6 MZR Waukesha engine. Terms. Melton Supply Company, Seminole, Oklahoma.

EQUIPMENT FOR SALE

FOR SALE OR TRADE

10,000′ 5½″ 14# Seamless Casing located Oklahoma City. Prefer to participate in oil deal. Write details. Box 995, Dallas, Texas.

FOR SALE

1—60,000 bbl. with pontoon roof, 100′ diameter x 42′ high standing at Brunswick, Georgia.
2—18,000 bbl. welded cone roof tanks located Ingleside, Texas.
The above tanks for sale as is, where is, or dismantled, matchmarked and loaded on cars.

Tancred Steel Construction Co.

Riverside 3546 — 312 Lacy Building — Dallas 1, Texas

FOR SALE—TWO STEEL PIPE MILLS

1—Manufacturers Seamless tubing from billets capacity to 6⅝″ O.D.

1—Resistance Weld Mill capacity to 6⅝″ O.D.
Suitable for manufacturing oil well casing.

Also—six 100 KW Diesel Generator Units

Priced to Sell

ARKO PRODUCTS CO.

546 Second Av., Detroit — WOodward 1-1894

USED STEEL TUBING

95,000 ft.	1½″ O.D.	Approx. 9 gauge wall
120,000 ft.	2″ O.D.	Approx. 11 gauge wall
55,000 ft.	2¼″ O.D.	Approx. 11 gauge wall
75,000 ft.	3¼″ O.D.	Approx. 10 gauge wall
80,000 ft.	4″ O.D.	Approx. 10 gauge wall
21,000 ft.	5½″ O.D.	Approx. $\frac{1}{4}$″ wall

Single or Double Random Lengths—Plain Ends
Beveled for Welding

Write—Wire—Phone

SONKEN-GALAMBA CORPORATION

2nd and Riverview (X-338) Kansas City 18, Kansas
THatcher 9243

A REAL BARGAIN!

50 LIGHTING PLANTS AT HALF PRICE

5 K.W. 120-VOLT D.C. DIRECT CONNECTED TO VE-4 WISCONSIN AIR-COOLED ENGINE

—with panel complete, mounted on steel skids. Metal weatherproof case. New equipment in original shipping cases, each with a set of maintenance tools and extra engine parts included.

SUBJECT TO PRIOR SALE — **BY LOT OR INDIVIDUALLY**

Wire—Phone—Write

LITTLE GIANT TREE FELLER CORP.

5428 KEATING — DALLAS, TEXAS — P.O. BOX 695
Phone L6-6614

EQUIPMENT FOR SALE

FOR SALE: Two type J 120 Reda Pumps complete with 6500′ of cable each. Two extra type V-25 pumps and one extra motor. Three 125 horsepower 300 w.p. straight leg steam boiler with burners and fittings. Excellent condition. Box 4725, Phone 62-6143, Oklahoma City, Okla., Mach-Bridges.

BIDS will be received by the City of Muskogee, Oklahoma, for Apx. 15800 L.F. of 4″ Steel Pipe to be salvaged by buyer, average depth 2½ to 3 feet, Dresser Sleeve connected. Bids close December 15, 1948. Address: J. R. Keeth, City Engineer, Muskogee, Oklahoma.

FOR SALE: Model 76 Star Drilling Rig complete w/ 5″ & 7″ tools. Dietz Drilling Co., 438 N. Elm St., Henderson, Ky.

FOR SALE: Cardwell self-propelled drilling and well servicing unit, complete with lines and tools for depths to 4000′. Excellent condition. Box C-675, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: We have abandoned several gasoline plants in Oklahoma and have available, cheap, quantity such items as absorbers, centrifugal and steam pumps, gas and steam turbines, steam engines, closed type heater and cooling sections, cooling towers, horiz. engine compressor units. Catalog with prices listing such material available upon request. Cities Service Oil Company, Patridge, Bartlesville, Okla.

2 GASO Fig. 1743 5½″ x 10″ horizontal duplex, enclosed type, all Timken bearing piston power pumps, Factory rating 213 gpm @ 500 lb. @ 54 rpm, together with two drives including 75 hp., 2300 volt motors.

POTASH COMPANY OF AMERICA
P.O. Box 31, Carlsbad, New Mex.

FOR SALE—USED GAS ENGINES

37—Stationary Gas Engines—2 cycle, with Belt Wheels. Make—Bessemer, Foose. Sizes range from 22 H.P. to 80 H.P. For inspection, correspond with or call:

SOUTH PENN NATURAL GAS COMPANY
Parkersburg, West Virginia

SHOT HOLE DRILLS
LARGE AND SMALL

All are truck mounted, rotary chain pull down, smallest pump size 3½ x 5. Some are in excellent condition, others need repairs. Price FOB Dallas from $3,000.00 to $8,000.00 including truck. For details write 8000 Lemmon Ave., Dallas 9, Texas.

FOR SALE
Used Oil Well Casing and Tubing

Now have in stock: 5½ in. casing, 14, 15½, and 17 lb. seamless or lapweld 7 in. O.D. casing, 17, 20, 23, 24, & 26 lb. seamless or lapweld 2 in. tubing upset.

Regular or lapweld 2½ in. tubing upset or regular seamless 10-in. drive pipe or casing.

ALL SUBJECT TO PRIOR SALE

OIL PRODUCERS INC.

314 Murray Bldg.
Grand Rapids, Michigan
Phone: Glendale 49201

EQUIPMENT FOR SALE

SAVE WITH SAFETY—Very Good Used Wire Line—Any Size or Length up to 5,000′—Respooled for Your Inspection—Cable Tools For Sale. General Tool & Supply Co., P.O. Box 4387, Phone 61335, Oklahoma City, Okla.

NEW STAR 71 Drilling Machine, mounted on '44 Dodge Truck. Drilling capacity 1,500 ft., 500-gallon water tank on tandem trailer. Bib and tools. $6,000.00. Rt. 10, Box 190, Tulsa, Oklahoma. Phone 9-0197.

MARTIN DECKER Slim Hole Weight Indicators. Reconditioned. Guaranteed New—$300. Ours—$135. Columbia Supply Co., 911 E. Independence, Tulsa, Oklahoma.

WELL drilling spudders, beams, light rotaries, core drills, tools, casing. Used equipment at money saving prices. Spang and Mills new tools. Leschen lines. Everything for well drilling. Pressey & Son, Pueblo, Colo.

1—Ingersoll-Rand Steam Driven Compressor—Imperial Type XPV Duplex, equipped with plate valves, automatic oil governor, and overspeed stop. Compressor has been two-staged. Box C-693, The Oil and Gas Journal, Tulsa, Oklahoma.

PIPE FOR SALE: 6,000′ 8″ 24# T & C, 22,000′ 7″ 17# O.D. Casing, 40,000′ 5½″ 14# O.D. Casing, 50,000′ 2″ 4.5# EUE-LW Tubing, 20,000′ 2″ 3.75# Line Pipe. The above pipe all single random lengths, located in West Virginia area, and is subject to buyer's inspection and prior sale. Goodman Pipe Corp., Box 257, Bradford, Pa., Phone 4169.

STEEL TANKS IN STOCK

2—74,000 BBL. LIKE NEW 114′ X 40′ TANKS ARE CLEAN—AT MORGANTOWN, W. VA.

1—5000 BBL. BOLTED AT NEW YORK

2—1000 BBL. BOLTED AT NEW ORLEANS

DARIEN CORP., 60 E. 42ND. ST., NEW YORK 17, N. Y.

MURPHY DIESEL, ME-66

Brand New—Sacrifice—At OEM's Cost 1103 cu. in., 6-cylinder, 180 HP, @ 1200 RPM. Never been used. 20% off list. Contact: Box C-613, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: USED PUMPS

19—Geared, Triplex, Outside Packed, Plunger Pumps. Make—National Transit—Denning—Gould; Sizes—6 x 8, 5½ x 8, 5 x 6, 7 x 10. For inspection, correspond with or call:

SOUTH PENN NATURAL GAS COMPANY
Parkersburg, West Virginia

FOR SALE

12—230 H.P. Type 10 Bessemer New 17′ Power Cylinders complete ready to run with 16″ to 18″ Compressors. 1—230 H.P. Clark Horizontal with Compressors. Located Salem, Illinois.

ENGLE PETROLEUM, Incorporated
Box 655, Evansville, Indiana

25,000 GALLON

HORIZONTAL TANKS

8—25,000 gal. Lapweld Construction 10′6″ x 40′6″ overall, ⅜″ shell and 7/16″ convex head plate thickness, designed 50# PSI, used, excellent condition. Suitable for storage fuel oil, gasoline, etc. Write for complete details.

Location: Tulsa, Okla.

HORWITZ PIPE & STEEL CO.

Ph. 2-9128 **Tulsa, Okla.**

EQUIPMENT FOR SALE

FOR SALE: Near Lyons, Kansas, string 4½″ drill pipe with tool joints, about 3,000′. Now a part of drilling rig. $2.00 per ft. Cities Service Oil Company, Mr. Patridge, Bartlesville, Oklahoma.

FOR SALE: Wilson Mogul draw works powered by G.A.K. Waukesha engine. Good condition, priced for quick sale. Terms. Melton Supply Company, Seminole, Oklahoma.

FOR SALE: Wilson well servicing unit, mounted on International truck, complete with line and tools, for depths to 4000′. Excellent condition. Box C-676, The Oil and Gas Journal, Tulsa, Oklahoma.

USED Fort Worth Spudder, size Super-D, first-class condition every place, including new bearings and chains throughout. Will spool 4000′ of ⅞″ wire line. Machine located Okfuskee County, Oklahoma. Inquire: Ingold, Room 1307, Philtower Bldg., Tulsa, Oklahoma. Phone 2-8095.

FOR SALE: Wilson Master Model Winch powered by 6 MZR Waukesha engine. Unit mounted on one and one-half ton Chevrolet truck equipped with fifty foot single pole telescoping mast. Terms. Melton Supply Company, Seminole, Oklahoma.

AUTOMATIC WELDING MACHINE SPECIALS

2 Union melt units, 1,000 Amps Westinghouse transformer, Flux Arc Recovery Units. Many Extras. Lots new parts. Fraction New Price.

COLUMBIA SUPPLY COMPANY
911 E. Independence, Tulsa, Okla.

FOR SALE: Emsco G-350 Draw Works bought July 1, 1948. Powered with two D-13000 Cats, but I will keep motors and you can equip with any you desire; or I will sell complete rig with mast. Draw Works designed for three motors. Rig is better than new because it will cost less and is complete with everything needed on rotary drilling rig. Reason for selling, too much rig for work in this area. This equipment will stand inspection. C-691, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

Approximately 7500 feet of New 7⅝″ O.D. 26.40# N-80 Seamless Casing with long type N-80 Couplings. Contact

AMERICAN DRILLING CO.
Box 710, Fort Worth 1, Texas
Phone 8-2301

FOR SALE

15,000′ New J-55 5½″ OD, 15½# Seamless Oil Well Casing, 8 Rd. Thr., Long Coup., Range 2
12,500′ Grade C, 7″ OD, 23# Seamless Oil Well Casing, 10 Thr., Long Coup., Range 2, Used in Excellent Condition
7,000′ J-55 2⅞ OD Ext. Upset Tubing, Used, in Excellent Condition
Subject to Prior Sale

WANTED

25,000′ New J-55 5½″ OD, 17# Seamless Oil Well Casing, 8 Rd. Thr., Long Coup., Range 2
12,500′ New J-55 7″ OD, 23# Seamless Oil Well Casing, 8 Rd. Thr., Long Coup., Range 2
50,000′ New J-55 2⅞ OD Ext. Upset Tubing, Range 2
50,000′ New J-55 2⅞ OD Ext. Upset Tubing, Range 2
Will Pay Top Price
Inquiries Invited

A. G. GHYSELS CO.
1209 No. State St., Chicago 10, Ill.
Superior 7-4412

EQUIPMENT FOR SALE

FOR SALE: Approximately $300,000 worth of new line pipe in stock. This pipe subject to inspection Hobbs, New Mexico. 8,742 ft. 8″ OD, 1,500 ft. of 8⅝″ OD, 17,910 ft. of 10¾″ OD, 10,566 ft. of 12″ OD, 41,915 ft. of 12¾″ OD. New Mexico Steel Products Co., Hobbs, New Mexico. Phone 999.

1—4,000′ POWER Rotary Drilling Rig complete with 87′ Moore Mast and Subbase. 2 EK Waukesha Motors with extension shafts (V-Belt), excellent condition. 6 x 16 Wilson Snyder Power Pump. 5 Drill Collars, Kelly, Etc. Will sell as one unit or separately. Phone 41213, Wichita, Kansas.

FOR SALE: At Ponca City Refinery, approx. 4,000 1 gallon lithographed new insecticide cans. 10c each take entire lot. Cities Service Oil Co., Patridge, Bartlesville, Okla.

NEW 5″ CASING COUPLINGS

Seamless, A.P.I. J-55 Specs., 8 round thread, 6¾″ lengths for 5½″ O.D. 14# and 15.5# casing. 1,500 available for immediate delivery.

HORWITZ PIPE & STEEL CO.
Ph. 2-9128 **Tulsa, Okla.**

NEW 4″ TUBING

150,000 ft. 4″ O.D., approx. 4#, Electric and Spiral Weld Tubing, with 4½″ O.D. x .237 wall Grooved Adaptor Nipples each end, 20 ft. pipe line sections, complete with couplings, tested 900#. Available immediate delivery, Houston, Texas.

EL PASO PIPE & SUPPLY CO.
Ph. 2-2615 **El Paso, Texas**

NEW CONTINENTAL RED SEAL ENGINES

15—Model Y-112, 46 cyl., 3 7/8″ bore x 3½″ stroke, 112 cu. inch displacement. 19.2 hp. @ 80 BMEP, and 1,000 ft. piston speed. Steel skid mounted, crated, enclosed, complete with electric starter, oil filter, air cleaner, and radiator, but less clutch.

HORWITZ PIPE & STEEL CO.
Ph. 2-9128 **Tulsa, Okla.**

EQUIPMENT WANTED

WANTED: Late Model used FAILING 1500 RIG, complete with 1200′ drill pipe, core barrel, small tools. 2019 W. T. Waggoner Bldg., Fort Worth, Tex.

WANTED: Used Cross Reaction Chamber. Approximately 5′ OD x 44′ long. State price, condition, location, enclose sketch. Box C-422, The Oil and Gas Journal, Tulsa, Oklahoma.

WANTED

VACUUM EQUIPMENT

Two or three stage vacuum jets with barometric condensers for use on vacuum tower charging 2000 barrels per day of topped crude to unit. Please give details of manufacturer, equipment size, former service, if second hand, quantity of non-condensable gas handled, steam and water consumption, etc.

Write, wire or phone, W. R. Shelton, P. O. Box 112, Phone 305, Winnsboro, Texas.

SERVICES

EXPERIENCED Independent Geological Draftsman will make formational top tracings, etc., of your information by contract. P.O. Box 1884, Tulsa.

HELP WANTED

ROCKY MOUNTAIN AREA oil jobs our specialty. Petroleum engineers, geologists, chemists, surveyors, draftsmen, write for information. Professional Placement Service, 613 Mack Bldg., Denver, Colo.

OIL Industry Employment Service, 319 Castle Bldg., Tulsa, Okla. Tom Robinson, Mgr. Phone 4-5974. No fees to pay. Needed in Persian Gulf area, Middle East. Division Pipeline Superintendent, salary open. Rotary drillers $565. Rotary derrickmen $495. Supervisory chefs $400. Oilfield welders $425. Write for details.

HELP WANTED
PROCESS ENGINEER

Technical training and experience to handle problems on Natural Gasoline plant design. Furnish complete data and salary requirement.

Personnel Department,

CITIES SERVICE OIL COMPANY
Bartlesville, Oklahoma

FOREIGN EMPLOYMENT In SAUDI ARABIA

ENGINEERS

Maintenance: ME's, EE's, CE's Power Engineers and Assistants, Process and Chemical Engineers

GEOLOGISTS

Surface Mapping
Sub-Surface
Economic

SENIOR PALEONTOLOGIST

SURVEYORS

Triangulation
Recorder-Triangulation
Precise Leveling

OPERATORS

Production, Gas Oil Separators, Topping Still, Natural Gasoline Plant and Auxiliary Power Plants

Career employment opportunities. Room and Board furnished. Paid vacation in U.S. after each 24-month period. Retirement plan and liberal benefits.

If interested, apply by letter giving complete employment and personal history.

ARABIAN AMERICAN OIL COMPANY
200 Bush Street Dept. 'A'
San Francisco, California

HELP WANTED

SUPERINTENDENT needed for new natural gasoline plant in northwestern New Mexico. Must be capable of inspecting construction work now in progress and training personnel. At least two years college training and prior supervisory experience necessary. Send details of experience and education to Southern Union Gas Company, 1104 Burt Building, Dallas 1, Texas.

WANTED: **Seismologist** — For work in Venezuela on a career basis. Must have degree in science or engineering and 3 to 5 years' experience in interpretation of seismograph records. Good salary, living allowance, bonus. Apply by letter or in person, stating age, education, qualifications, etc. Replies will be held strictly confidential. Richmond Exploration Company, 515 International Trade Mart, New Orleans, Louisiana.

OIL FIELD production engineer with capabilities of general superintendent to direct the completion of deep rotary drilled wells. Give record of experience. Initial salary $850.00 per month. Answers held confidential. Box C-679, The Oil and Gas Journal, Tulsa, Oklahoma.

CHEMICAL ENGINEER

Exceptional opportunity offered engineer with experience in the fundamental design and operation of natural gas processing equipment. Primarily want person with ability and knowledge to direct and supervise engineering program and assist in sales. Letter of application should include photograph, personal data, record of education and experience, references, and expected salary range.

BOX C-695
THE OIL AND GAS JOURNAL
Tulsa, Oklahoma

PERSONNEL AND LABOR RELATIONS

Completely integrated oil company with approximately 1500 to 1700 employees has excellent opportunity to offer the right man—

Age—37 to 43 years.

Experience—Minimum of 5 years in Petroleum Industry in Personnel and Labor Relations, including actual experience in negotiating labor agreements.

Education—College, including some law.

Applicant must be Southern born or must have lived in the South for the past 10 years.

Salary—Commensurate with ability and experience.

Box C-698, The Oil and Gas Journal
Tulsa, Oklahoma

ENGINEERING

During the next several months we will increase our Engineering Organization engaged in the design of Oil Refinery Plants and Power Plants. Location Cleveland, Ohio. The men we need should be qualified as draftsmen, designers, checkers or in higher engineering skills on design of piping, instrumentation, pressure vessels, structural steel, concrete, mechanical or electrical. For presenting your qualifications and prompt consideration, write to us for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

HELP WANTED

ENGINEER

For machinery manufacturer and dealer. Well established large reputable firm located in New Orleans. Must have engineering education and be experienced and capable of supervising drafting and shop fabrication and machining as well as be familiar with marine and stationary diesel installations, and related pumps, generators, and accessories. Good salary and position for the right man. Do not apply unless you have at least six years practical experience in this field. Replies confidential. Reply Post Office Box 941, New Orleans, giving complete history of experience, photograph, age, and salary expected.

WANTED: Supervisor for refinery pump and engine maintenance. Applicant must have engineering training and experience. Good salary with house furnished at low rent. Box C-692, The Oil & Gas Journal, Tulsa, Oklahoma.

INSPECTORS

Experienced on welded pressure vessels, fabricated piping and other oil refinery equipment. Location —Ohio or Tennessee. Give complete personal data and experience record, including salary desired, in first letter, or write for application form.

ARTHUR G. McKEE & CO.
2300 Chester Ave., Cleveland 1, Ohio

SITUATIONS WANTED

GEOPHYSICIST: Graduate Engineer with ten years seismograph experience as Party Chief and Supervisor over twelve state area desires position in seismic review or interpretation at permanent location. Presently employed as Supervisor of several seismograph crews. If interested, please give general information as to salary and position available. Box C-677, The Oil and Gas Journal, Tulsa, Oklahoma.

OILFIELD SPECIALTY MANUFACTURERS
Manufacturers' agent for production and drilling accounts in the Gulf Coast of Texas and Louisiana, Arkansas and Mississippi, has opening for additional account. Can give complete coverage in this area. Can also furnish warehouse facilities in Houston. Box C-684, The Oil and Gas Journal, Tulsa, Oklahoma.

GEOLOGIST. Fifteen years major company experience, desires connection with Independent Mid-Continent Operator. Box C-697, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE

CRUDE OIL FOR SALE: 42°A.P.I., approximately 1500 barrels per month, possibly increasing to 15,000 per month in one year, handled by Interstate Pipe Line Carrier. Will sell to highest bidder (field price $2.65). Box C-694, The Oil and Gas Journal, Tulsa, Oklahoma.

ALUMINUM PAINT—200—6 gallon cans, Exterior Spar Varnish vehicle. Highly polished, Aluminum Paste pigment in separate container. Distributors Liquidation. Regular price $33.60—take any part, $12.00 per 6 gallon can. Send check with order. The National, 606 Walnut, Kansas City, Missouri.

SMALLEST Miniature Tri-Cone Rock Bit made. Less than one-half inch diameter. Cones turn. Gold or Nickel plate. On tie chain clasps, strap type for watch fobs and ring type for charms. $5.00 each. Money Order or C.O.D. H. McGaughey, P. O. Box 11063, Houston, Texas.

ROYALTIES

DEEDED ROYALTIES
San Juan Basin & Permian Basin. Write Harry S. Wright, Wright Bldg., Farmington, New Mexico.

ROYALTIES IN HOT AREAS!
Recent strikes have focused attention on Montana's deeper oil zones and major companies are moving fast, drilling and leasing. We buy direct in the field, sell direct to our customers. Write LANDOWNERS ROYALTIES COMPANY, Box 1225, Great Falls, Montana.

WANTED: ROYALTIES AND PRODUCTION. We are buyers. Send full particulars. Immediate action. Gerber & Company, 120 Wall Street, New York.

LEASE AND DRILLING BLOCKS

BLACK Mesa Basin (N.E. Ariz.) acreage four structures fairly well blocked. Protective acreage other structures. Geology by C. C. Smith. Fred Blair Townsend, Luhrs Tower, Phoenix, Arizona.

830-ACRE block, Osage County, Oklahoma. Near production with four sands 1600 to 2050'. Will farm out block to responsible operator who is financially able to drill several wells and develop block. Box C-652, The Oil and Gas Journal, Tulsa, Oklahoma.

FOR SALE: Oil and Gas Leases in shallow territory and on structure. Will make flat price on one or more leases, drilling and casing one or more wells. W. P. Harley, Bowling Green, Ky.

TO LEASE for oil 640 acres Reagan County Texas 5 miles S. W. Styles 3 miles north University lands Quarter mile south Centerela on Middle Concher River at Big Rock. L. B. Dougal, 2001 Concourse, Bronx, New York.

FOR SALE: Lease in drilling blocks in Utah and Arizona and some leases on the Navajo Indian Reservation. 50 cent rental. C-699, The Oil and Gas Journal, Tulsa, Oklahoma.

WILL sacrifice 40 acre lease Lincoln County, Miss., 1/32 royalty interest in spread 4700 acres Ocala uplift Florida. 2½ acres mineral deed Grapeland field, Texas. Luella Schultz, 607 7th St. North St. Petersburg, Fla.

LEASES ROYALTIES
PRODUCING OR NONPRODUCING
Texas, New Mexico, Oklahoma, Louisiana and Illinois
Inquiries Invited
B. D. BUCKLEY
60 Broadview Drive, Clayton (5), St. Louis, Missouri

PATENT ATTORNEYS

PATENT Practice before U. S. Patent Office. Validity and Infringement Investigations and Opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 418, 815-15th Street, N.W., Washington 5, D. C.

LEGAL BLANKS

BURKHART LEGAL BLANKS since 1908. Oil-Gas (all states), Business, Real Estate, Legal Forms, Leases, Revised With Government Regulations, Commercial Printing, Catalog and Samples on request. Burkhart Printing & Stationery Company, 115 South Cincinnati, Tulsa 3, Oklahoma.

PERSONAL

Application for Membership in the Diesel Engineers International Assn.
576 Newark Ave., Jersey City, N. J.
Name .....
Address .....
Reference .....

Equipment Men

(Continued from page 160)

ton; John M. Berry, Kennedy Tank & Manufacturing Co., Inc., Indianapolis; Joseph Redman, J. K. Welding Co., Brooklyn; James P. Hamilton, Chicago Bridge & Iron Co., Chicago; Roger Bramble, Lacy Manufacturing Co., Los Angeles; Inge Grant, Wyatt Metal & Boiler Works, Dallas; Ralph E. Kramer, Hammond Iron Works, Warren, Pa.; R. C. Palmer, Birmingham Tank Co., Birmingham; Howard Kornberg, Fargo Foundry, Fargo, N. Dak.; J. R. Hill, McNamar Boiler & Tank Co., Tulsa; and R. H. Beck, Pittsburgh-Des Moines Steel Co., Pittsburgh.

The terminal storage program was one of several at which the steel industry advisory committee balked. A number of fabricators met with OIC officials earlier this month and urged that new efforts be made to secure the allocation, and it will be pressed as part of the plan to put through all of the program which have been stalled in the steel committee.

LeTourneau Appoints Bohuslav and Richards

R. G. LeTourneau, Inc., has appointed Hans A. Bohuslav as special engineering consultant to R. G. LeTourneau, president. Bohuslav comes to LeTourneau from Engineering Controls, Inc., of Los Angeles, where he was vice president in charge of engineering and production. He is recognized throughout the engineering profession as an authority on high-power diesel and gasoline engines. Bohuslav will make Longview, Tex., his headquarters.

LeTourneau has also named Wendell V. Richards as central sales manager. He succeeds W. B. Worden, who has resigned to return to the West Coast, where he has accepted a position with Noble Co., Oakland. Richards has been associated with the company since 1936 and will have supervision of district representatives and distributors in 20 midwestern states and 3 Canadian provinces from Peoria headquarters.

Koppers Signs Agreement For Distributing Agitator

The Engineering & Construction division of Koppers Co., Inc., has signed an agreement with Dr. Bronislaw Goldman, Pittsburgh consulting engineer, whereby it will furnish the Goldman agitator for chemical or other industrial plant installations. The agitator, recently patented in America, works on an entirely new principle. It is so constructed that it propels liquid to the sides of the tank and upward. At the top, the liquid is drawn to the center where it is pulled downward through the hollow axis upon which the agitating blades are fastened. It is expelled from the bottom of this hollow axis to repeat the process.

Gifford to Cover Mathieson Territory

Henry Gifford has joined the heavy chemical sales division of Mathieson Chemical Corp. with headquarters in Chattanooga, and will cover Tennessee and adjoining states, it is announced by D. W. Drummond, vice president-manager of sales. Prior to joining Mathieson, Gifford was on the sales staff of Allied Chemical & Dye Corp.

Report on Recoverability Of Olympic Sand, Issued

The fifth in a series of informal oilfield reports has been issued by the U. S. Geological Survey. The recent report gives the results of a detailed investigation and study of the possibilities of applying secondary-recovery methods of operations, particularly water flooding to approximately 2,775 acres of the Olympic sand in the Olympic field in Hughes and Okfuskee counties, Oklahoma.

The 106-page report, which includes 16 tables, reviews the early history of the field and deals with surface and subsurface stratigraphy, structure, reservoir performance, characteristics of the Olympic-sand body, and an estimate of the volume of oil recoverable by water-flooding methods.

The Olympic sand in this field has shown that it is of the gas expansion type and shows possibilities for future development.

Copies of the report may be had upon request to the Oil and Gas Supervisor, U. S. Geological Survey, Federal Building, Tulsa.

Import Export Balance May Depend on New Field Finds

WASHINGTON. — A summary of tariff information on crude petroleum and refined products was issued by the Tariff Commission last week, part of an exhaustive study which eventually will cover every commodity entering into our foreign trade.

The summary is a factual and statistical analysis of exports and imports and tariff rates from 1921 to 1947, inclusive, and the commission draws no conclusions other than that, if consumption continues to increase, unless several new major oil fields are discovered the prospects are for decreased exports and increased imports of crude and a possible decline in exports of refined products.

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CALENDAR OF EVENTS

December

American Association of Petroleum Geologists, regional meeting, Rice Hotel, Houston, Tex., December 2-3.

Petroleum Electric Power Association, twentieth annual meeting, Biltmore Hotel, Oklahoma City, December 2-3.

National Gasoline Association of America, regional meeting, Amarillo, Tex., December 10.

Interstate Oil Compact Commission, quarterly meeting, Allis Hotel, Wichita, Kans., December 9-11.

1945

January

Society of Automotive Engineers, annual meeting, Book-Cadillac Hotel, Detroit, Mich., January 10-14.

February

American Society for Testing Materials spring meeting and A.S.T.M. committee week, Hotel Edgewater Beach, Chicago, Ill., February 28-March 4.

March

National Association of Corrosion Engineers, annual convention, Cincinnati, Ohio, March 7-10.

American Petroleum Institute, Southwestern district, Galvez Hotel, Galveston, Tex., March 9-11.

American Petroleum Institute, division of production, Mid-Continent district meeting, Mayo Hotel, Tulsa, March 23-25.

New England Gas Association, Hotel Statler, Boston, March 24-25.

Western Petroleum Refiners Association, thirty-seventh annual meeting, Plaza Hotel, San Antonio, Tex., March 28-30.

American Chemical Society, division of petroleum chemistry, spring meeting San Francisco, March 27-April 1.

April

American Petroleum Institute, Division of Refining, mid-year meeting, Shamrock Hotel, Houston, April 4-7.

American Society of Lubrication Engineers, annual meeting, Pennsylvania Hotel, New York, April 11-13.

National Association of Corrosion Engineers, Netherlands-Plaza Hotel, Cincinnati, Ohio, April 11-13.

Southwestern Gas Measurement Short Course, University of Oklahoma, College of Engineering, Norman, Okla., April 12-14.

National Petroleum Association, Hotel Cleveland, Cleveland, Ohio, April 13-15.

Natural Gasoline Association of America, annual meeting, Texas Hotel, Fort Worth, April 20-22.

Southern Gas Association, annual convention, Buena Vista Hotel, Biloxi, Miss., April 20-22.

American Petroleum Institute, Eastern district, William Penn Hotel, Pittsburgh, Pa., April 27-29.

May

Independent Petroleum Association of America, mid-year directors meeting, New Orleans, La., May 2-4.

American Gas Association, natural-gas department, spring meeting, French Lick Springs Hotel, French Lick, Ind., May 9-10.

American Petroleum Institute, division of production, Pacific Coast district meeting, Biltmore Hotel, Los Angeles, Calif., May 12-13.

American Petroleum Institute, Rocky Mountain district, Gladstone Hotel, Casper, Wyo., May 26-27.

June

American Society for Testing Materials, fifty-second annual meeting, Hotel Chalfonte Haddon Hall, Atlantic City, N. J., June 27-July 1.

NOMADS

Houston Nomads, second Monday of each month, The Houston Club, Houston.

Los Angeles Nomads, second Wednesday each month, Jonathan Club.

Louisiana Asks for Bids

HOUSTON. — State Mineral Board of Louisiana has advertised for bids on 12,125 acres of state lands. Bids must be received on or before December 14. The 15 tracts being offered include acreage in the following parishes: Assumption, St. Mary, Terrebonne, Cameron, Morehouse, Iberville, Caldwell, Richland, St. Martin, Jefferson, Madison, Lafourche, and Bossier.

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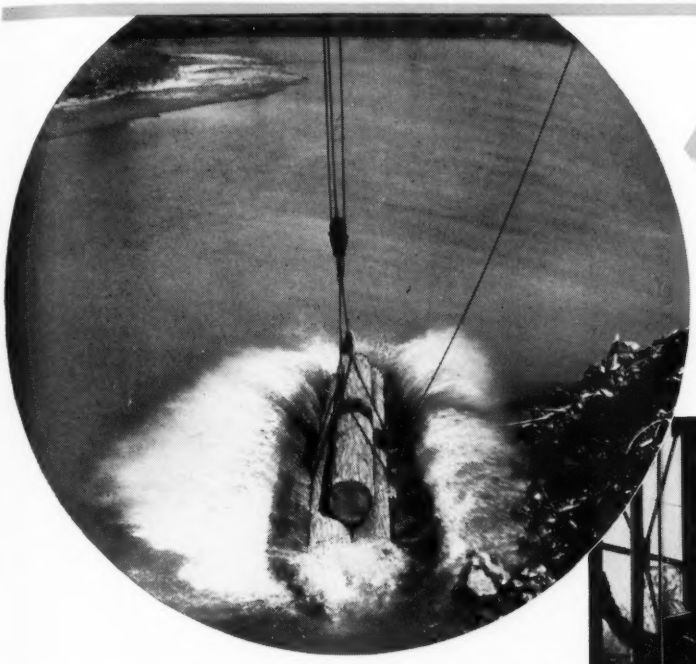
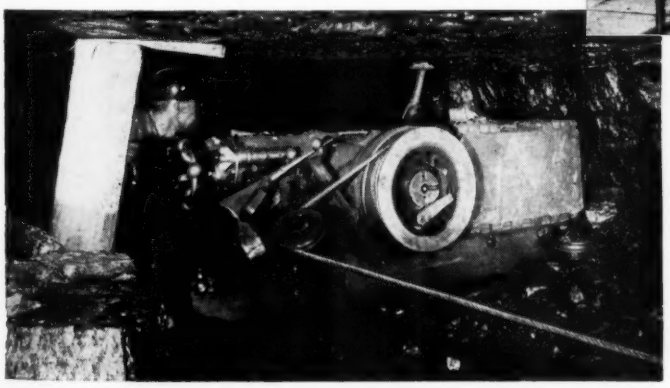
Improving Production with LAY-SET PREFORMED



Dropping logs into the river with a swing boom unloader. When logs hit water an automatic trip on the hooks frees the mainline straps. Buoyancy of logs in water slacks the mainline, and weight jerks hooks free from strap loops. With a load of 5,000 board feet (40,000 pounds), that's a lot of lifting, jerking and quick-slackening for the wire rope—but Hazard LAY-SET Preformed takes it in stride.

In oil drilling—Improved production with LAY-SET Preformed wire rope is quickly evident in the oil fields. Because LAY-SET is a "relaxed" wire rope, it takes bending stresses, whipping and straining—with ease. The result is fast, uninterrupted production—more barrels of oil per day.



Short wall cutting machine at work in a coal mine. Here, where wire rope failures would seriously affect production, operators depend upon LAY-SET Preformed wire rope. Its longer life means steadier, more profitable production.

***LAY-SET** Preformed wire rope will improve production on your lifting and pulling jobs too. Be sure to specify* LAY-SET Preformed *the next time you need wire rope.*

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